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HANDLING • CRUSHING • SCREENING • WASHING

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Engineers

COUNSELLORS IN INDUSTRIAL OPERATION & FINANCE

327 S. LA SALLE STREET

CHICAGO

May, 1922

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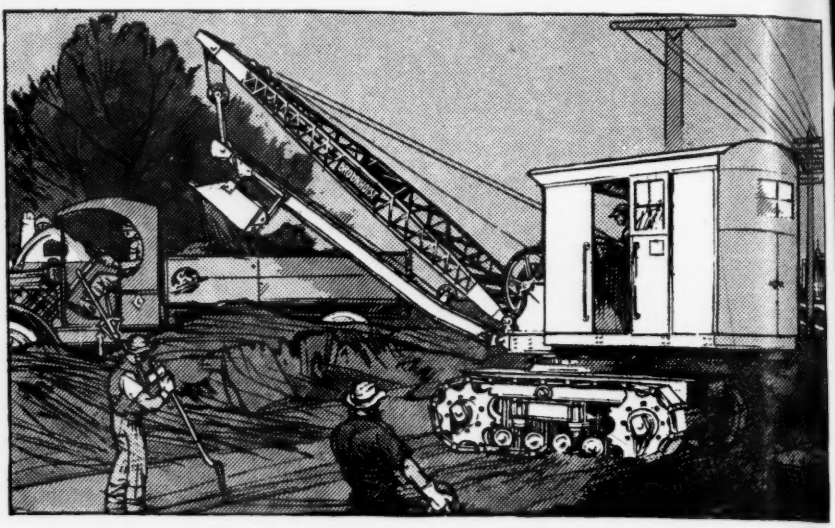

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Over Six Months on the Job—Not One Moment's Delay

Handling stone and sand with clamshell, stripping and excavating with shoveling arm or working with hook or other attachments, a Brownhoist crane is speedy and dependable on all kinds of construction work.

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Brownhoist No. 2 cranes are made with creeper truck, road wheels or 4 or 8-wheel railroad truck mounting. Steam, Gas Engine or Electric drive.

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MATERIAL HANDLING MACHINERY

Pit and Quarry

Member Audit Bureau of Circulations
A Monthly Journal for Producers of Sand, Gravel, Stone, Cement, Gypsum and Lime

VOL. 6 CHICAGO, ILL. MAY, 1922 NO. 8

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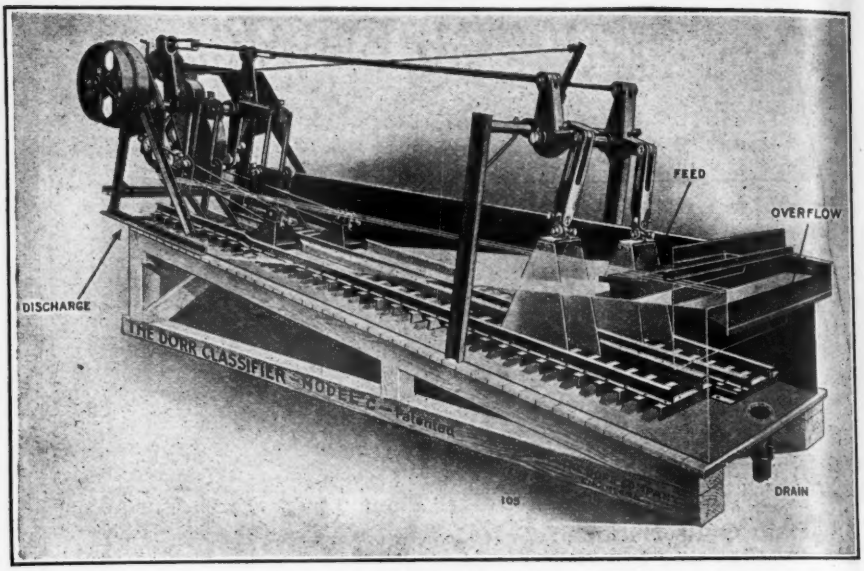

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RESEARCH TESTS DESIGN EQUIPMENT

Pit and Quarry

Vol. 6 Chicago, Ill., May, 1922 No. 8

Considerations for Sand and Gravel Producers

IT is advisable in opening up a sand and gravel proposition, to make a thorough investigation before rather than afterward. The fact that a man has a bank or a pit, or can obtain sand and gravel from a stream, is not sufficient. He may start developing the proposition only to find that a profit cannot be made, due to one of a half dozen reasons. The operator should post himself before beginning his operations.

Consideration should first be given to the deposit. Know that you have the sand and gravel, of what grade, quality and quantity. This can be done by making a sub-surface survey. Several articles published in PIT AND QUARRY during recent years have outlined how such a survey should be made at a low cost. An engineer or a chemist should pass upon the chemical composition of the sand and gravel and their grading and quality. These things will give you the basic facts to found your future business upon.

The next thing to know is your possible market. It means nothing to know that sand and gravel is being used in that locality. Find out where the supplies are coming from, the names of users, the prices being paid, the extent of future building and road operations, so as to judge to what extent your business can be developed.

This naturally leads to another consideration, namely that of the kind of products that your market will require. It is surprising how this will vary in the different localities and it means much not only in selling but in deciding upon your plant. For naturally a man will arrange to furnish what will find the easiest sale.

The next feature has much to do with your business and the size of your plant, namely, the yardage or tonnage brought daily in your market and what percentage of it you will be able to sell. Your plant must be built to conform to the probably sales you can make.

At the same time the design of the plant should be so made as to allow of additional units being added as the business is developed or to materially add to its size if the plant is not built upon the unit idea.

The next thing essential is to investigate the concerns from whom you are to purchase machinery and allow to design your plant. You must know if their past erections have been successful. Have they been in business long and are they likely to continue? Have they the engineering skill to do justice to your proposition?

Lastly, what facilities will you have for making shipment by trucks, railroad, or water, and at what cost for transportation? How will the freight rates you must pay compare with those those being paid by your competitors?

In some cases the lack of roads for truck operation together with a high freight rate have prevented large companies from competing with small competitors who could make water deliveries.

View from front of plant, showing cars ready for hoisting up track to spike mill

Federal Phosphate Rock Plant

THE phosphate rock plant of the Federal Chemical Company at Ridley, Tenn., is one in which uniquely designed equipment and capable management are employed to secure efficient operation and a large output of material.

Some of the methods employed by this company differ almost radically from those in force in most phosphate rock operations and the plant is consequently a very interesting one from the viewpoint of the visitor. Mr. Sheldon, superintendent, says that it is an equally interesting one from the viewpoint of the management and that its efficiency since the time it was opened shows all the ideas of the designers to have been sound.

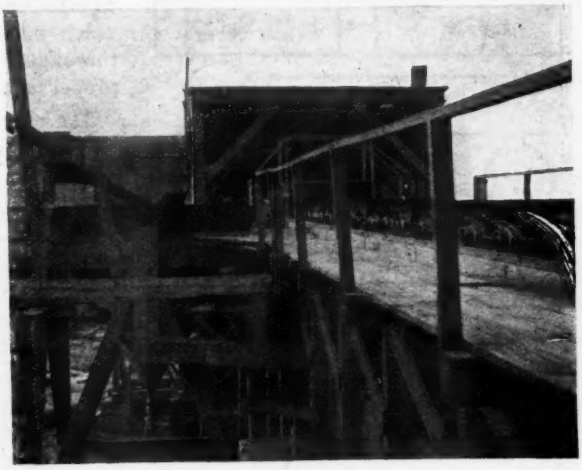
The phosphate rock is taken from an extensive deposit which is worked at a number of points within a mile and a half or two miles of the plant. The material that is being excavated at this time is much leaner than that which was used years ago and, to a large extent, includes rock that was moved during the early operations. To secure a good finished product it is now necessary to exert much more care in the mining and put the rock through a costly process that was unnecessary years ago when the rock was ready for the making of acid phosphate almost as it came from the ground.

An idea of the methods employed in mining the rock can be had only from an understanding of the nature of the deposit and the manner in which limestone and phosphate occur together. The miners are all expected to make a careful selection of the proper material and load it into dump cars for conveying in trains to the plant. Because of the fact that care must be exercised in selecting materials, all this work of loading is done by hand. Steam shovels were once used but it was found that, while the shovels were able to get more material out of the ground the quality of this material was not comparable with that produced by hand methods and the greater cost of hand loading was offset by the savings made possible at the plant by the handling of rock containing a smaller percentage of clay and flint.

Two shovel draglines are used to move overburden, the same overburden that was moved years ago when the ground was worked over in the less careful fashion of that time. One

of these shovels is a Bucyrus with a 2-yard bucket, the other a Marion with a 1-yard bucket. Together these machines move from 600 to 800 yards per day.

When the plant is running at full capacity about 85 men are needed to insure the proper supply of material. Most of the work now going on is being done in a field about 2 miles from the plant. An interesting observation of Mr. Blackburn, who superintends the mining operations, is that there are 10 miles of track laid between the plant and the workings.



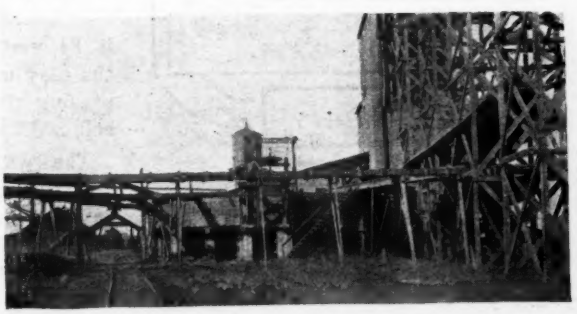
Allen cone at left, 84-foot "drag" at right

The plant itself was designed and erected about 7 years ago by the F. L. Smidth Co., of New York. A considerable amount of the machinery was especially made under the supervision of Smidth engineers who also evolved the systems that have been operating very efficiently ever since.

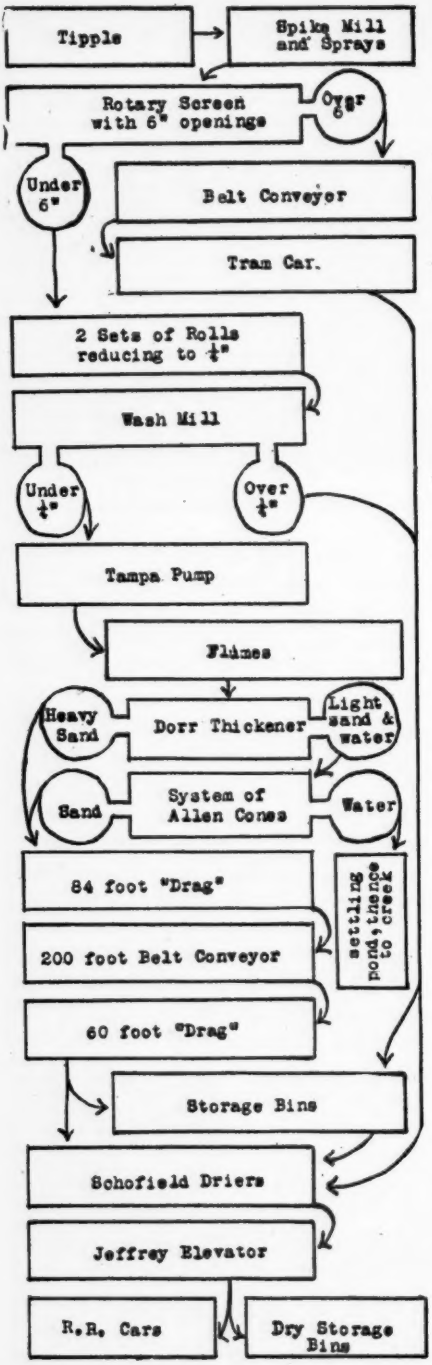
Material is brought to the plant in end-dump cars of the type shown in the photo containing about 2¾ cubic yards each. A friction hoist at the top of the inclined trackway shown is used to haul the cars up. This piece of equipment handles about 500 cars in each working day, bringing the cars up to an end dumping tipple which causes the material to be dropped to a spike crusher. This crusher reduces the stone to 6 inch size and it is then passed to an 8 foot rotary screen. Three jets of water are blown into this screen while the crushed rock is being turned over in it and wash it very thoroughly.

Two sets of Power and Mining Machinery Co., rolls next take up the work, reducing the material to ¼ inch. It is then passed to the wash mill and thoroughly washed. Rejections from the screen, which passes rock less than 6 inch, are thoroughly rewashed to remove all foreign adhesions and sent by a conveyor to tram cars which dump at the driers.

The smaller material, which is likely to contain a larger amount of foreign substances, offers a much more difficult problem. It involves the work of clay elimination and sand



Dorr thickener in center, showing also flumes for return water



Progress of materials through the plant

separation and both of these processes must be gone through very thoroughly before the phosphate is in proper condition for the driers.

The elimination of clay is the most difficult and exacting operation carried on in the whole plant and calls for the use of some very ingeniously designed machinery. The first of these is a large octagonal washmill in which the phosphate and the water are agitated by a system of chains and draw bars. These last act as beaters, each of the chains and bars giving the mass 8 knocks in one of its courses around the mill. This action has the effect of reducing nearly all of the clay to solution and permits its being run off through a spillway at one of the 8 sides of the mill. The diagram of this mill, shown on page 57, will give a fairly adequate idea of the way in which it does its work.

After the material has been thoroughly washed a gate is opened and everything under ¼ inch is permitted to go direct to the large settling bins where it remains for from 24 to 36 hours. It is then taken up by a 6 inch Tampa pump manufactured by the Tampa Machine and Foundry Co. of Tampa, Fla., and passes into flumes which lead to the large "drag" where all the remaining clay is removed. The "drag," as it is called at the plant, is an 84 foot conveyor with scrapers 66 inches wide which gives each bit of material that goes through it 84 vertical squeezes, rubbing out the clay under enormous friction and passing the phosphate to a conveyor belt 200 feet long and 22 inches wide.

The water from the flumes that feed this drag has a large amount of valuable sand in it and provision is accordingly made for salvaging. This water flows into a Dorr thickener where it is rewashed and concentrated. It is then put through a system of

Allen cones which save the valuable phosphate sand and pass it back to the big "drag." Sand so fine that only 1.9 per cent stays on a 100-mesh screen is saved by these Allen cones and the waste overflow contains nothing but clay.

After the "drag" has passed the material to the 200 foot conveyor belt, this latter carries it to another "drag" 60 feet long with scrapers 24 inches wide, which still further purify it, removing all vestiges of clay and delivering to the driers or storage bins a phosphate rock free of foreign substances.

At the storage bins or driers it meets the rewashed material rejected by the 6 inch rotary screen early in the process and carried by train car and conveyor to the storage bin or driers. It also meets here the material over ¼ inch which did not pass the screen at the wash mill.

Before it goes to the driers the phosphate contains from 22 to 25 per cent of moisture. The driers reduce this moisture to the amount guaran-

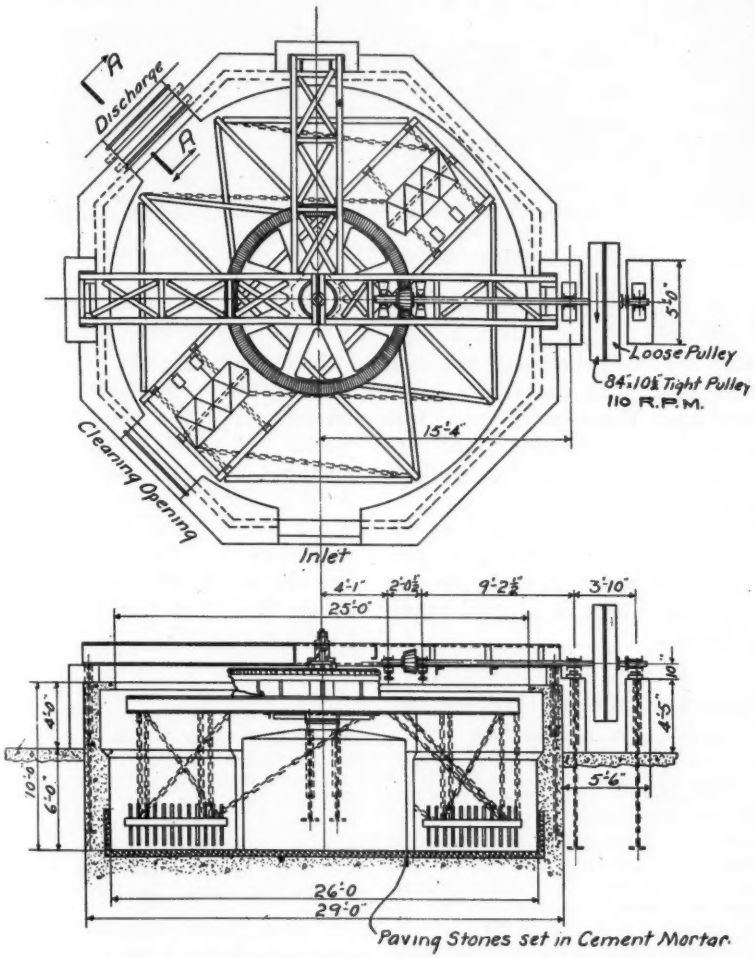
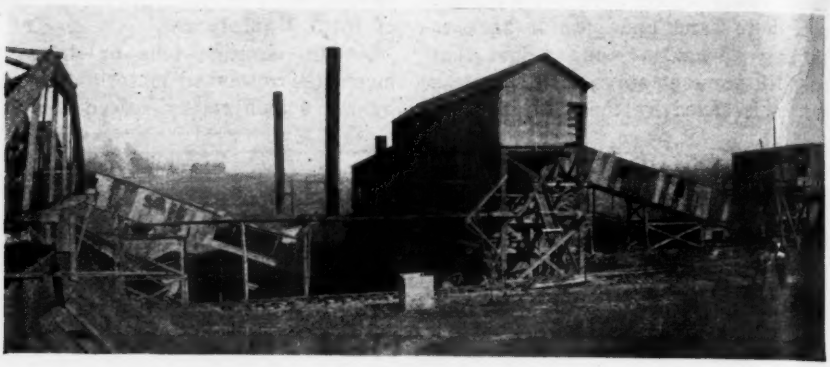


Diagram of Washmill Described on Preceding Page



Storage building in center; dry storage at left, driers below

teed in the sale, usually about ½ of 1 per cent.

There are two Schofield driers with a capacity of 150 tons each for a 10 hour day. These driers are 40 feet long, 6 feet in diameter and are equipped with Herdman forced draft systems.

The phosphate is taken up from the driers by a Jeffrey elevator and passed to railroad cars or to the dry storage bins where it is held ready for shipment.

The Federal Chemical Co. does not produce any ground phosphate rock.

In the power plant are five boilers totaling 600 horsepower. These were manufactured by the Atlas Boiler works of Indianapolis and are equipped with Herdman forced draft. A Worthington pump and a Fairbanks-Morse pump are used for the water supply. There is a large Corliss engine of 300 horsepower made by the Erie City Iron Works of Birmingham.

New Folder of National Lime Association

In quite a unique way the National Lime Association calls particular attention to the bulletins issued by its Construction Department on topics of interest to contractors and others who are in the market for lime. These booklets are described very briefly on 12 pages of a 16-page folder which, when folded down to its smallest size, is 3½ by 4 inches. Above each of the listings of construction publications is a snappy cartoon that furnishes sufficient guarantee that any one into whose hands the booklet may fall, will be sure to look at it. On two of the last pages are listings of publications put out by the Chemical Department and the Agricultural Department of the National Lime Association. One more page is used for a title page and one for the imprint of the Lime Association member distributing the folder.

Copies of this folder will be available for distribution within the next week or two, and members are urged to procure a supply.

The topics touched upon in various publications on the Construction, Chemical and Agricultural Departments are ones of prime importance. They concern themselves with some of the later uses that lime is made to serve, and are written in a style that will prove most popular with the men they are intended to reach.

The Bureau of Foreign and Domestic Commerce reports that imports of hydraulic cement in March amounted to 1,597 barrels, valued at $4,308. The total for 1921 was 122,317 barrels valued at $388,828. The imports in March were from Mexico, 902 barrels; France, 322 barrels; Japan, 253 barrels; other countries, 120 barrels. The statistics of exports of hydraulic cement in March are not available. The total exports in 1921 were 1,181,014 barrels, valued at $4,276,986.

It Sets the Pace for the Job

IT IS but natural when there are a large number of men at work at one place that there should be some machine to set the pace for a job. In the South amongst the negro laborers it is common to sing while they work. One old foreman who had worked negroes for about forty years encouraged the singing, but the instant a slow, dragging song was started he made them change the tune to one that had some pep to it. He knew that singing set the pace for the job.

Dependent upon the character of the job there is generally one machine that will set the pace for the job. On a concrete job it is the mixer that sets the pace, while on an excavation job, it is the steam shovel. In a stone quarry, or a gravel or sand pit, when cars are used for tranporting, it is the speed and method of handling the cars that sets the pace for the work, and not the crusher or screening plant. The crusher can't produce without stone nor can a washing plant or screen produce without sand or gravel.

In the past, in small quarries and pits, it was evident that it was not practical, for a limited output, to install a locomotive; for it was not only expensive to run when work had to be done, but it was just as expensive when the dinkey stood idle for several hours. Thus men were used to push cars, and if this was not done then horses or mules were used. These things meant that the movements of cars were bound to be slow, with all the attending work carried on at the same pace. This need no longer be the case, for there are on the market a large number of power motors for pulling short and long trains. Some of these are operated by oil, others by gasoline or its substitutes, and still others by electricity.

Where a large number of cars are handled each day, these motors will do as efficient work as the steam locomotives, and possibly two or more may be used and may be kept busy every minute of the day. Where a limited number of cars are handled only one motor may be needed, and if this must be idle for several hours the power can be shut off and the expense ceases.

It is this fact that allows a motor to be used even in small operations. The cars are handled so much more promptly that the operator can frequently carry on his work with less cars. The promptness with which the cars are handled will keep the plant operating to nearer its capacity and whether men or machines are used for loading the cars this work will be done with greater dispatch. All of these factors tend to reduce costs considerably.

There is no longer anything experimental about these motors. Every type has been on the market long enough to be tried out and the various manufacturers stand behind their machines.

Steam locomotives are still used and in some cases have certain advantages, but the various motors have made possible the use of mechanical power over animal power and in doing so have given a new pacemaker for quarry and pit work.

The world's production of graphite in 1921 reached a lower figure than at any time since 1902, as shown by the statistics at present available, according to Arthur H. Redfield, of the United States Geological Survey, Department of the Interior. The world-wide depression in the graphite industry which characterized the year 1920 was continued in 1921. The stagnation of graphite mining in the United States is both a part and a result of world-wide conditions, the natural consequence of overproduction in 1917 that was stimulated by the abnormal demand for graphite crucibles during the World War.

Dead Men for Derricks

A READER asks to have described in PIT AND QUARRY some anchors or dead men for holding in place either the stiff legs of a derrick, or the guy lines of complete circle-swing derrick.

For the last named derricks the dead men can be made in a number of ways. If there is a solid rock floor the easiest and quickest way is to drill holes into the rock and lead into it some heavy eye bolts to which the guys can be fastened. These bolts are placed at small cost.

Even cheaper than this is to use trees or stumps of trees. The guy lines or cables can be fastened around them. If there is danger of injuring the tree with the cable, lagging several inches thick can be placed under the cable against the bank. The pieces of lagging can be placed several inches apart. With stumps there is danger of the cables slipping off the top of the stump. This can be prevented by driving several ship spikes into the stumps near the top to hold down the cables.

If these things cannot be used, then dead men must be sunk into the ground. Here a heavy timber, generally from 6x6 to 12x12 inches square, is used, according to the size of the derrick mast and the load carrying capacity of the derrick.

The guy lines can be fastened around the timber, but a better method for a permanent derrick is to put an eye bolt through the timber and fasten the guy cable to this bolt. To do this the proper iron or cast iron washers should be used. A plate for this is shown in Fig. 1. It can be made in proportional size to suit the timber and the bolt.

In Fig. 2 is shown how the eye bolt is placed through the square timber

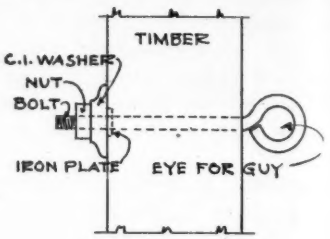


Fig. 2

and how the cast iron washer is used under the nut on the end of the bolt. There should be a long thread on the bolt so that the nut can be tightened after the guys are attached and the derrick set. This long thread and nut are much better than a bolt head, for they admit of adjustment.

The post for the dead man is placed at an angle with the perpendicular of about 30 degrees. This is shown in Fig. 3. A hole is dug into the ground for the timber and at its foot a place is reamed or dug out to take a piece of timber or log from 3 to 5 feet long. This timber is well tamped in with dirt before the rest of the hole is filled. Just under the ground another heavy timber is placed as shown in the

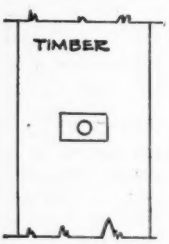


Fig. 1

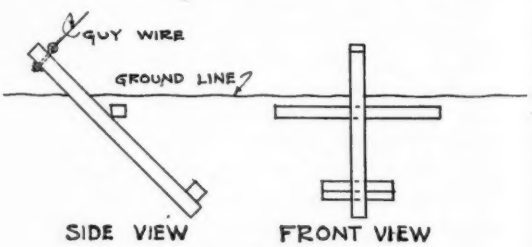


Fig. 3

sketch. This timber should be as long if not longer than the guy post. It is also well to drift the two timbers together. This long timber should be well tamped in place.

This is one of the best types of dead men that can be placed but the objection to it is the expensive digging and the back filling and tamping, besides the expensive timber. For

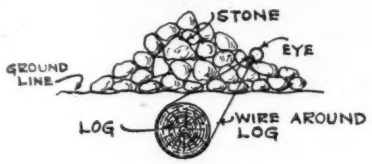


Fig. 4

a permanent derrick this is not so bad, but for a temporary use of a derrick for only a short period of time the cost of dead men can be reduced by using the type shown in Fig. 4.

This is simply a long, heavy log with some old cable wrapped around it and run up out of the ground to an eye to receive the guy line. The log is buried under the ground in a shallow trench and on top of it is piled a lot of loose stones of varying sizes to hold the log in place. If the stone is available it does not take long to place these dead men, for most of the stone can be placed after the derrick starts to work.

It is also possible for temporary use to build a crib work of old timbers or logs on top of the ground and fasten the guy wires to the timbers. The cribs can be filled with broken stone to give stability to them and thus dead men are made.

For gravel pits and similar places where derricks are to be used permanently it is an excellent practice to sink a square pit for a dead man. Then place a template in the bottom holding a long eye bolt and cast on top of the template a block of concrete and thus have a dead man made of concrete. The size of the block will depend upon the size and capacity of the derrick.

This covers the subject for guy derricks. In another article stiff leg derricks will be discussed.

The broad field of mineral fillers is sadly lacking in standardization. Many users of filler materials have very indefinite knowledge of their requirements either in color, grain size, grain shape, or chemical composition. The standardization of fillers is practically an untouched field, and such standardization accomplished through a comprehensive study of the subject, would not only promote better manufacturing processes, but would be of material benefit to producers. It is claimed by one producer that the cost of purchasing special screens to satisfy the requirements for odd sizes of his finished product for one customer destroys most of the profit obtained from grinding roofing grade talc.

A notable accomplishment in the direction of standardization of nonmetallics was the decision of the paving brick manufacturers, at a conference held at the Department of Commerce in Washington in November, 1921, to eliminate 55 out of 66 styles of paving bricks being produced, leaving but 11 standard types of this material.

The statement has been made that a Boston firm manufacturing pipefittings has taken advantage of the present period of industrial inactivity to make a careful analysis of its business, with the startling result that of the 17,000 products listed in its catalog only 650 have been bringing any profit to the firm. Obviously an effort will be made to reduce or eliminate the manufacture of as many as possible of the unprofitable products.

The Standard Sand and Gravel Company, of Wheeling, W. Va., has made application for permission to use a considerable portion of the wharf and city property adjoining the wharf, for the establishment of a sand and gravel business. This proposition is not looked on with much favor by the river and shipping interests, nor by the other sand companies of Wheeling.

O. A. BLAKESLEE, PRES. CLARENCE BLAKESLEE, TREAS. GEO. E. HALL, SEC'Y

THE NEW HAVEN TRAP ROCK CO.

TRAP ROCK FOR CONCRETING CONSTRUCTION AND ROAD BUILDING

W. SCOTT EAMES, GENERAL MANAGER

T. R. BLAKESLEE, 1ST VICE PRES.

GENERAL OFFICE, 67 CHURCH ST., NEW HAVEN
TELEPHONES LIBERTY 6430-6431

NEW HAVEN CONN. March 10, 1922.

Dear Sir:-

We will start operating our large plant March 13th and will then be at your service.

Spring is but a few days away and it is time to start repairing roads after the winter. They need attention. Most of the States, Cities and Towns are planning their greatest Highway year. It will help the large number of unemployed citizens, to get started early. Towns are endeavoring to buy the best road materials. Trap Rock withstands the heaviest traffic

Our road experts are at your service. Ask for our prices on Trap Rock. Apply Trap Rock Screenings on your dirt roads and see the fine results at little cost.

Our quarry to-day is one mile and a quarter long, and is one of the largest in the world. We expect the largest production this year.

The railroads will give you quick service.

We aim to give quick delivery, the best material and courteous service.

Yours very truly,

THE NEW HAVEN TRAP ROCK COMPANY

W. Scott Eames

General Manager.

Put Human Interest in Quarry Ads

The New Haven Trap Rock Company of New Haven Conn., does not believe in hiding its light under a bushel. Mr. W. Scott Eames, general manager of the company and president of the National Crushed Stone Association, understands well the importance of intelligent publicity. Therefore the above letter announcing the beginning of 1922 operations at the big New Haven plant. Therefore, also, the three interesting blotters shown on the next page.

The letter was not aimed at doing anything startling. Its purpose was merely to get on record the fact that the quarry is open and doing business. The company was thus in no danger of losing any of the earlier orders that might have been let in ignorance of the fact that the quarry was open. The letter told, too, in a dignified way

DOCK TERMINAL AT PINE ORCHARD, CONN.

BINS HOLD 8000 TONS. SCOWS ARE LOADED BY ELECTRIC POWER IN ONE HOUR AND TEN MINUTES.

67 Church Street THE NEW HAVEN TRAP ROCK CO. New Haven, Conn.

LARGE PARTY OF VISITORS LEAVING THE QUARRY

PRODUCTION IN 1921, 926,145 TONS.

OUR Trap Rock Quarry is one of the largest in the world. The quarry face is one mile and a quarter in length.

THE NEW HAVEN TRAP ROCK CO.
67 CHURCH STREET
NEW HAVEN, CONNECTICUT

BLAST AT TOTOKET MOUNTAIN, NORTH BRANFORD, CONN.

160 GUESTS WERE PRESENT AT THIS BLAST.

THESE BLASTS average one a month, shooting down 50,000 to 70,000 tons of rock each time.

THE NEW HAVEN TRAP ROCK CO.
67 Church Street
NEW HAVEN, CONN.

of the service that the New Haven company can give.

The blotters employ an idea that has considerable value. There is much human interest in them, for they give intimate glimpses of a business which to the average outsider is quite a mysterious one. The idea of bringing visitors to the quarry to witness the blasting and other operations has a very definite publicity value.

Rules for an Organization

A WORKMAN appeared at the office window of a quarryman with a complaint about his time and pay. He was listened to and then told, "You are wrong, as that would be against our rules," and the man was compelled to go away disappointed.

What were the company's rules and who knew them? That is the question that is difficult to answer for many organizations. There may be many rules regarding work, care of tools and machines, paying men, and many other details. In fact, it is impossible to employ a number of men without having rules and regulations and if these are followed then they must be known to one or more officers of the organization. If these men knew these things then they should let all the other men in the organization know the same things, for there should be co-operation of all to strengthen the organization and make it a profitable business.

The easiest method of accomplishing such results is to have all the rules and regulations written out and either posted where the men can see them or have copies placed in their hands.

This does not mean that a large expense must be incurred to make up rules and print them. Printing may be necessary and advisable when the organization is large and the operations are located at several different places, but there are many ways of duplicating writing that cost but little, and in most cases these methods can be followed.

It is quite surprising how effective it is to impress a man by handing him a set of rules of the organization of which he is a part, or which he is about to enter. The writer has been a firm believer in having written rules. He has used them and any man who could read, upon applying for a job, was given the rules to read over and after finishing was asked if he could abide by them and follow them if he were given a job. After that he could make no excuses as to not knowing the rules.

Such rules and regulations should be drawn up covering every feature and detail of the work, both the office and outside work.

Those rules for handling accounts, keeping costs, and all such office details should be gotten up in one form so that the men who have to do with the field work only need not see or know anything about the office details. The rest of the rules can be gotten up in a form that can be put into the hands of all the workmen, foremen and mechanics.

There are many of these headings, some of which for the office rules would be such as:

Accounting
Cost-Keeping
Shipping Reports
Office Records
Banking
Pay Rolls

For the field forms some of the headings are:

Employing Men
Pay Periods
Care of Tools and Machines
Reports
Care of Explosives
Blasting
Accidents
Organization chart

One thing that must be kept in mind is the fact that many rules that are first gotten up will be discarded as impracticable, while many others will be added.

Even workmen will from time to time make suggestions as to new rules or criticise those that are in use. Many suggestions will be discarded, but the best organizations are those that obtain all the information and knowledge that every man in the organization possesses. This may mean much and strengthens the bond between employer and employees.

Well Arranged Illinois Gravel Plant

THE new sand and gravel plant of W. H. Ritzert located just outside the city of Naperville, Illinois, is one in which compact arrangement has been secured without resorting to any of the space saving expedients that so often result in the "sardine can" type of plant, which does not allow a proper accessibility to all the working parts.

The company at present controls 11 acres of good gravel bearing land in which the percentage of foreign material is quite low. The gravel occurs evenly throughout the deposit to the depth of about 45 feet. Mr. Ritzert has been producing small amounts of gravel from this deposit for a few years back, and has just erected his new plant, which will have a 10-hour capacity of 500 yards, for which there is a splendid market in the immediate vicinity.

The plant was designed by the Smith Engineering Works of Milwaukee, under the direction of Mr. Donald D. Barnes, manager of the Smith Company's Chicago office.

The sand and gravel are excavated by two Bay City dredges, one of which has been in operation for the past year, and the second of which has just been installed to help the old dredge in the work of producing material for the new plant.

The two dredges load 1½-yard steel end dump cars running on a 30-inch gauge track. A No. 2 Telsmith friction hoist pulls the cars from the pit

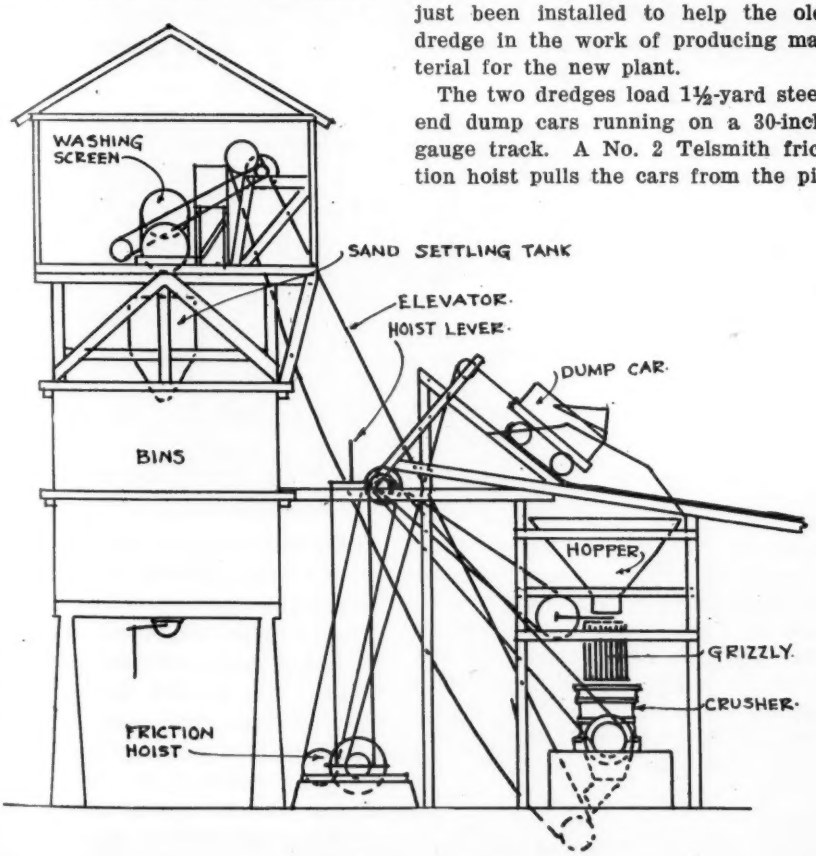


Diagram of Plant From Side

up an inclined track to a point over the plant receiving hopper, where they dump automatically. The hoist itself is located on the ground near the base of this hopper, but is controlled by levers banked on a platform level with the top of the hopper so that the operator can keep the cars in sight at all times.

The plant receiving hopper into which the cars dump is twelve feet

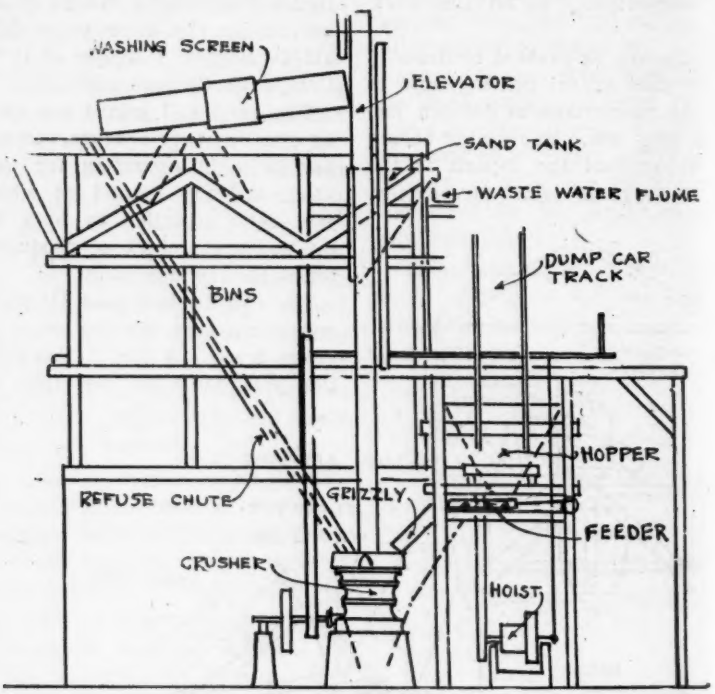


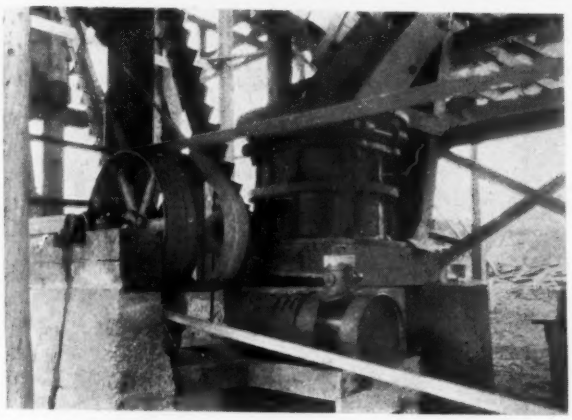
Diagram of Plant From Rear

square at the top and tapers down to a 16-inch square bottom opening. Covering this bottom opening is a 16-inch by 5-foot Telsmith reciprocating plate feeder, which automatically and evenly feeds the sand and gravel onto the top end of an arrow bar grizzly with 2¼-inch openings between the bars. This assures a steady flow of material through the plant at all times.

The lower end of the grizzly rests on the spider of a No. 4 Telsmith gyratory crusher equipped with manganese steel wearing surfaces. All material above 2¼ inches rolls over the grizzly into the crusher, and all material under 2¼ inches passing the grizzly goes to a small hopper under the crusher, into which the crusher also discharges. This arrangement relieves the crusher of handling all the finer material which does not require crushing.

This small hopper under the crusher discharges directly into a No. 4 Telsmith chain elevator, 51 feet between centers, and made of buckets 12 inches wide, mounted upon Rex chain. This in turn discharges the material into a steel lined box on the top of the bins located slightly higher than the opening to the washing screens. Here a stream of water hits the sand and gravel and washes it into a Telsmith 32-inch by 16-foot

View from Side, Showing also Contractor's Loading Bins on Hill at Left

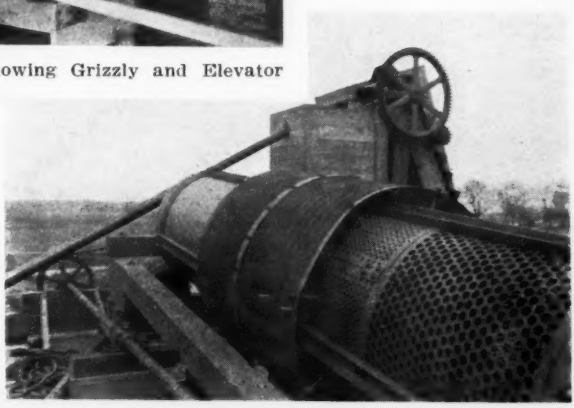


No. 4 Telsmith Crusher, Showing Grizzly and Elevator

heavy duty washing screen, set at right angles to the elevator.

This Telsmith washing screen is equipped with a 5-foot scrubbing section, a 5-foot sand jacket, 6 feet of ¾-inch perforations, 3 feet of 1¼-inch perforations and 2 feet of 2½-inch perforations. The sand jacket is punched with ⅜-inch holes, and extends 5 feet from the scrubbing section over the ¾-inch screen section.

The scrubbing section of this washer is equipped with flights and lifters that turn the dirty sand and gravel over and over in the



Note Pipe for Water to Flush Gravel From Box

The Predominating Plymouth Locomotive

Predominates in every industry that has summoned gasoline locomotives to its aid.

Predominates in its ability to deliver power and endurance.

Predominates in the economy of upkeep.

Predominates in the confidence of those who have bought and used.

Predominates in the integrity of its hardware

Predominates in Sales, Service and Satisfaction.

MR. R. L. BONHAM, President of The Tri-State Construction Company, Bridgeton, N. J.

MR. BONHAM'S LETTER

Gentlemen:

We are pleased to advise that we have found the PLYMOUTH Locomotives satisfactory in every particular, and do not feel that we have any room for complaint. They have fulfilled our greatest expectations. Our regular trains consisted of 12 cars, each carrying 2 boxes containing a 5-bag batch, 1-2-4 mix, and operating against a 3.6 per cent grade.

Predominates in the integrity of its workmanship.

Predominates in Sales, Service and Satisfaction.

Ask for literature.

The Fate-Root-Heath Co.
Plymouth, Ohio

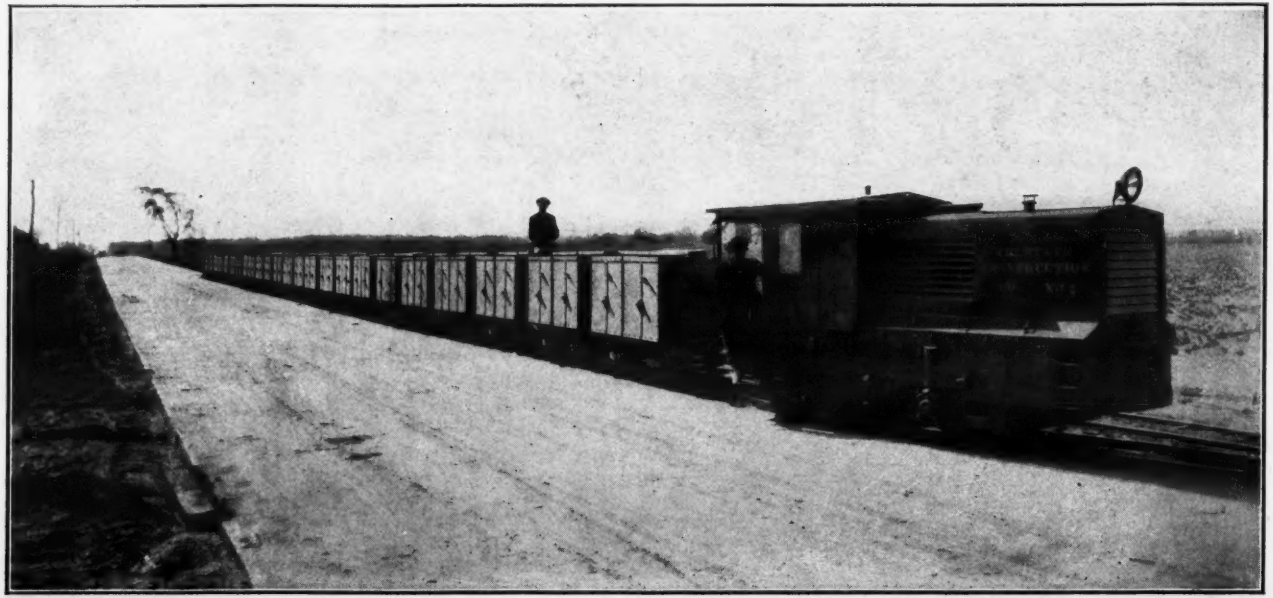
Gentlemen:

We are pleased to advise that we have found the PLYMOUTH Locomotives satisfactory in every particular, and do not feel that we could ask for more than they have given us. They have exceeded our greatest expectations. Our regular trains consisted of 12 cars, each carrying 2 boxes containing a 5-bag batch, 1-2-4 mix, and operating against a 3.6 per cent grade.

I am unable to figure how this was possible, as the weight of train was around 50 tons, requiring a draw bar pull of approximately 4,000 lbs., which is materially in excess of your claim of 2,400 lbs. All I can say is, THEY DID IT.

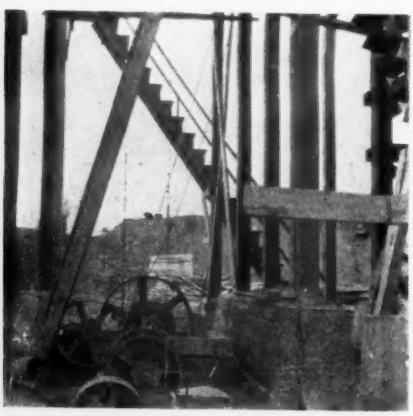
I feel that this was made possible by the fact that our cars were equipped with Hyatt Roller Bearings, and believe that this extra cost was an exceptionally good investment. Sincerely yours,

R. L. BONHAM, President.



Two Bay City Dredges Excavate Gravel. Temporary plant in Foreground

water and then push it into the screening section of the washer. Here the sand, dirt and water flow through the ¾-inch perforations, also through the ⅜-inch sand jacket into a flume that takes it to a No. 6 Telsmith automatic steel sand settling tank. The gravel remaining in the screen is given a final spraying by a spray pipe extending into the receiving end of the screen and then is sized and discharged into the gravel bins. All material too large to pass the screen sections is chuted back to the crusher and re-crushed.



Hoists Mounted on Ground. Cableway Hoist in Foreground

The Telsmith No. 6 steel sand settling tank automatically settles the sand out from the dirt and water, which flows off through a flume to an unused portion of the gravel pit. This sand tank can be adjusted so as to automatically give either a wet or dry product. The weight of the settled sand in the tank, which is balanced against a set of weights and through a system of levers, opens and closes the discharge valve of the tank. Adjusting the weights so that a large volume of sand collects before the tanks begin to discharge gives a drier product.

Telsmith duplex type bin gates discharge the material from the bins into trucks which can drive either underneath or alongside the bins. Ap-

proximately 200 yards bin capacity is provided.

A 60 h. p. Venn-Severin oil engine running at 250 r. p. m. drives the counter shaft of the No. 4 Telsmith crusher. Another pulley on the crusher counter shaft drives a jack shaft located half way up the No. 4 Telsmith elevator. This jack shaft in turn drives the elevator by a belt up to its head end, and also drives the Telsmith plate feeder and Telsmith hoist. The Telsmith washing screen is driven by a chain drive from the back-geared shaft of the elevator.

Two bin gates located on one side of the main bin discharge sand and gravel alternately in a cableway bucket. These bin gates and the hoist operating the bucket on the cableway are handled by one man. The bucket containing sand or gravel is run on its cable over to two side hill receiving hoppers, one for sand and one for gravel. These discharge into a one-yard concrete mixer, where mixed concrete is loaded into trucks and taken out onto a state road under construction. This cableway is operated by a Mundy belted hoist furnished by the Harry Channon Co., who also supplied the bucket and other cableway equipment.

Water is supplied to the plant by a deep well pump manufactured by the Aurora Pump Manufacturing Co. This takes water from the well 100 feet deep, and discharges into a sump 8 feet deep from which a 4-inch centrifugal pump with a 3-inch discharge and 4-inch suction supplies 300 gallons per minute for the gravel washing operation. The centrifugal pump is also a product of the Aurora Pump Manufacturing Co.

The Carmichael gravel pit, at Attica, Ind., which is the largest of its kind in the state, has opened for the summer season. Besides the ordinary demand for gravel, the company has received an order for 35 cars a day on road work.

Ohio Quits National

Action Taken at Recent State Convention at Columbus

The Ohio Sand and Gravel Producers Association held their annual meeting at Columbus, on Thursday, April 13th.

This was one of the best meetings in the history of the association. The meeting was devoted to consideration of practical and timely matters.

Probably the most important action taken by the association was the withdrawal of the Ohio Association from the National Association, as an association, effective July 1st, 1922.

The following officers were elected:

President, F. E. Hall of T. J. Hall and Company of Cincinnati; vice-president, E. A. Evans of the Zanesville Washed Gravel Company of Zanesville; secretary-treasurer, F. C. Fuller, Portsmouth Sand and Gravel Company, Portsmouth; executive secretary, Guy C. Baker of the Greenville Gravel Company, Greenville.

Directors: R. E. DoVille of the DoVille Lake Sand & Gravel Company, Toledo; F. D. Coppock, Greenville Gravel Company, Greenville; Harry Donnelly, Ohio Gravel Ballast Company, Cincinnati; Frank Tejan, Wiggim Crushed Stone and Sand Company, Germantown; and H. R. Gill, Island Sand and Gravel Company of Columbus.

The annual dues were reduced from four mills to two mills per ton.

Several new members have recently come into the association and the coming year promises to be the most promising in its history.

The Automatic Gravel Products Co., on Muscatine Island, Muscatine, Iowa, are making mechanical improvements at their plant, which will greatly increase its capacity.

The Green Bay Sand and Gravel Company, Green Bay, Wis., has been incorporated with a capital of $50,000. Incorporators: Harry A. Bond, Fred Hansen, and Chas. F. Kelly, of Green Bay.

Fire of unknown origin partially destroyed the plant of the Wickwire Limestone Company, at Gasport, New York, on March 23rd. The loss is partly covered by insurance, and it is believed the plant will be rebuilt.

Position of Cement Manufacturers

By HENRY M. STIMSON

When the case came up in New York against the cement manufacturers, the early part of April, for violations of the Sherman anti-trust law, the following opening statement was made for the defendants:

The defendants deny absolutely the charges of the indictment, that there was any suppression of competition among them or any agreement to suppress it. We will go much further than a mere denial. We propose to lay the facts of this industry before you to let you see the way in which these manufacturers carried on their business, become familiar with the operation of their minds, and see that this has not been a criminal business and that their minds have not contained any criminal purposes.

There are four cardinal points which we propose to make in our evidence and which I hope the jury will carry in their minds as the case unfolds.

First, that at all times there has been constant, keen competition between these defendants. We shall show you that investigators of the Government itself have spoken of this industry as "the most individualistic of the larger branches of manufacture" and have spoken of the competition between the various cement manufacturers as "bordering on the cut-throat variety."

Second, that their profits have been extremely low—on an average, according to the Government's own statistics, hardly more than half the average of all the other manufacturing corporations of the United States. In 1919, these men earned on the average on their invested capital a return of only seven per cent, and in 1920 a return of only five per cent.

Nineteen-twenty was the period of the highest prices obtaining in this and the other industries of the United States, and the rate of return which these cement manufacturers then obtained on their capital was just one-third of the rate which the four Circuit Judges of this District have declared in a decision to be a fair and proper return on the invested capital of a manufacturing industry.

Third, that during the great period of war and post-war inflation, when the prices of all commodities of this country rose tremendously owing to the depreciation of our money standard, the manufacturers' price of cement rose less than almost any other commodity, and far less than the average. For example, the price of cement rose far less than the price of coal, which is one of the most important ingredients entering into the production of cement.

We shall show you that in the spring of 1919, at the request of the Government and in order to give industry a chance to recover itself, these manufacturers voluntarily reduced the price of their product 15 cents a barrel.

Fourth, we shall show you that the two associations to which these manufacturers belonged, instead of being devised as instruments to suppress competition, have been used to make competition broader and more intelligent; that the only purpose of their existence has been to spread the use of cement, in which they have been extremely successful, and, by furnishing to the various manufacturers statistics of production, stocks, shipments and accurate knowledge of the amounts of cement called for by outstanding contracts, to enable them to carry out their competition far-sightedly and with a view to its permanence. The surest road to monopoly lies through the ignorant, cut-throat competition which enables one manufacturer to bankrupt and absorb another through the latter's ignorance of necessary conditions.

We will show you that the work of these associations was directly in line with recommendations which were being made publicly throughout the United States by the Federal Trade Commission at the time, and we shall also show you that the Chairman of the Federal Trade Commission personally addressed the Portland Cement Association and commended its activities, and we shall show you further that every step proposed to be taken by the other association, the Cement Protective Association, was communicated to the Federal Trade Commission and stenographic minutes of all its meetings were filed with that Commission, together with copies of its statistics.

The Government proposes to offer evidence that the quoted prices of ce-

ment coming from these different manufacturers have been similar or identical at given times in the same market, and have continued so for long periods of time. No one disputes that. No other condition would be possible in the case of a standardized product like cement and under such keen competition as exists in the cement industry.

We will show you that in the case of cement, as with many other standardized products, similarity of price is a necessary result, not of combination, but of competition.

We shall show you that Portland cement has within the past seven or eight years been completely standardized so that there is practically no difference between the various brands of the different manufacturers. Each brand contains the same material as every other brand. These standards have been set up, not by the manufacturers themselves, but by the United States Government, the American Society of Civil Engineers and the American Society for Testing Materials.

It is a movement which has for its purpose to promote the public safety by creating uniformity of strength in a material which enters into every construction. From this condition it necessarily follows that at any given time in a free market all of the different brands will command the same price.

No buyer will pay more for one article when he can get a precisely similar article for less, and the minute one manufacturer lowers his price, provided his capacity is sufficient to affect the market, all others must at once follow or they will get no business.

We shall show you that this uniformity of market price at any given time in a given market is a common characteristic of many other standardized commodities where competition between manufacturers is keen, such, for example, as salt, wire nails, wood screws, anthracite coal in steam sizes, crude oil and gasoline, sulphur and many drugs and chemicals.

Everyone knows how the standard size loaf of bread brings everywhere at the same time the same price and yet no one would think that all bakers in the United States were organized into a trust.

Furthermore, we shall show you that cement is such a common and widely distributed product and these Eastern manufacturers, who are the defendants here, are, compared with some other industries, so small in capitalization that the distribution of their product is necessarily made mainly through dealers.

To distribute it themselves direct to the consumer would involve an investment of capital in warehouses, trucks, etc., all over the country which would be prohibitory. More than sixty per cent of the cement produced goes into the small lots which the dealer peddles out to retail customers, and in addition to that he controls the sale of 20 to 25 per cent more of the product which goes to larger consumers. As a result, the market of these defendant manufacturers is necessarily a dealer market. They are largely at the mercy of the dealer for the distribution of their goods, and everyone knows that a dealer market tends to be a one-price market.

A manufacturer who tries to give more favorable terms to one dealer than he does to another very promptly gets into trouble. We shall show you that some of these companies send out their quotations to as many as 5,000 dealers, scattered throughout New England and the Middle States.

Any change of mill price to one of these dealers means a corresponding change to all, for the change will be known at once, and any change on the part of a competitor, provided the competitor is not one of the smallest of the defendants, must be watched for and followed.

From these two general characteristics—the standardized commodity and the dealer market—necessarily results substantial uniformity in the market price, just as in any given day on the Stock Exchange the market price of a standard security like Liberty Bonds is uniform.

We shall show you that the market price of cement remained substantially uniform, even when every manufacturer was selling below cost, during one of the bitterest cut-throat wars in the history of the industry, and we will show you that practically the only time when it was not substantially uniform was during the brief period in 1920, when, owing to railroad strikes and coal shortages, there was for a brief period a great demand for cement, which even the utmost efforts of these manufacturers

could not supply, and prices were at their peak

But underneath this substantial uniformity of market price, we shall show you these 19 defendants competing with the utmost intensity, struggling constantly to get away business from each other, employing large forces of salesmen, carrying on expensive advertising, to show the reliability of their respective brands and the excellence of their service, and striving in every honest way to build up their business at the expense of their competitors.

We shall show you that this competition served to keep the market price of cement so low that many cement companies, including some of these very defendants, have been through periods of failure and bankruptcy and the average rate of their return upon the amount of their invested capital during the time complained of in the indictment has been far below the average received by other manufacturing industries throughout the United States, and less than one-third of the amount fixed by our courts as a legitimate rate of return.

Cement-Making Prospects in Ceylon

Some time ago several samples of clay and lime were sent from Ceylon to the Imperial Institute in London to ascertain if any of them were suitable for the manufacture of cement. It is now reported that some Jaffna clays are quite suitable for the purpose.

The commercial aspect of the manufacture of cement in Jaffna (an island separated by a very narrow channel from the northern extremity of Ceylon) is now being examined. The main difficulty, so the Ceylon correspondent of the *London Times Trade Supplement* reports, is the high price of coal. The possibility of developing a small hydro-electric scheme to operate the plant is now being studied. Experiments are also being made to find out if palmira or coconut shells could be used in place of coal.

The clays and limes of the island have not been studied systematically with a view of employing them for industrial purposes.

F. J. Colgan, president of the Colgan Limestone Products Co., Columbus, Ohio, has announced that his concern has opened another plant at Monroe, Jackson County, Ohio. This is the company's third establishment, the others being at Greenfield and Zanesville. Mr. Colgan expressed the opinion that with the removal of the 40 per cent advance in freight rates, shipments of limestone for agricultural purposes will increase rapidly.

The Pennsylvania Sand, Gravel and Supply Co., has been organized at Pittsburgh, Pa., with a capital of $100,000, by Edwin Brown, J. E. Best, C. Schully.

Allen Patterson

"Has certainly been a help to us" Says Patterson

"PIT and QUARRY always has a welcome place in our office and I want to take the liberty of commending you people on the good work you are doing," says Allen Patterson, Secretary and Treasurer of the Bluffton-Lewisburg Stone Company, Lima, Ohio.

"The crushed stone and gravel business has grown to such an extent in the last few years that it has become a real business and your magazine has certainly been a help to us.

"It is surely appreciated by us and we look forward with interest for its arrival. We consider this publication worthy of merit and your success is assured."

Hoover States Views

Addresses National Construction Conference at Chicago

The program of the National Construction Conference held at the Drake Hotel in Chicago, on April 3, 4, and 5, had as its salient feature an address by Herbert S. Hoover, Secretary of Commerce. In addition to Mr. Hoover's address, there were talks by quite a number of other men whose opinions along these lines are worth much.

The meeting brought to the attention of those attending the big forward steps that have been taken, largely through standardization, in the elimination of waste and unnecessary cost of construction. The Associated Tile Manufacturers, for example, showed that the varieties of their products have been reduced from 735 to 115

The Association put itself on record as approving the efforts of the Secretary of Commerce and the Attorney General of the United States to ascertain the limits within which trade associations can legally carry on their work. The Association also passed resolutions providing for the appointment of a Committee to investigate the possibilities of financing a campaign of education to counteract false beliefs that home ownership was not as profitable as other forms of investment. The Association also resolved to establish proper schools and use other means or the training and instructing of building craftsmen. They also condemned the discouragement of investment and private construction through the freedom from taxation of incomes from States and their subdivisions.

Secretary Hoover's talk followed lines laid out at the beginning of his speech when he expressed frankly the convictions of the Department of Commerce upon three separate matters. These are as follows:

"First: The practices of some small minorities are unendurable. They smear with shame the high standards of American business and labor, they drag in disrepute that vast majority of good men in these vital industries. This situation simply must be cleaned up. The Government can catch occasional crooks but the cleaning can be done infinitely better by the decent men in the industry if they will organize to do it. It must be done if we would protect our business and commerce from the steady invasion of regulatory hands of the government. I wish to emphasize again that the vast majority of men in these industries do not engage in these practices, but some out of self-defense are forced into them by others.

"Second: A great field of service to the industry itself and to the country as a whole lies in the elimination of those great indirect wastes which are beyond the control of any one individual man or concern and can therefore only be accomplished by associated action. And if we could secure the housing and construction now so badly lagging behind our needs, we must cheapen its costs. It can be cheapened at a gain in stability to the industry and still hold high standards of living amongst the vast army of workers in the industry. Efficiency in industry is more important to the nation than the margins of profit or the rates of wages over which we do most of our quarrelling.

"Third: To accomplish these ends, we need cleaner organization of the trades, not the destruction of trades organization. The initiative of the single individual is the most precious part of our whole economic fabric. But there are limits beyond which, if we would make the full field of national efficiency, we must have co-operation between individuals. This is not a limitation of individual initiative; it is an extension of it. The restraint of crooks does not necessitate the restraint of constructive action for better business practices."

Elaborating upon these themes, Mr. Hoover repeated his statement that the dishonest operators in the construction industry must be weeded out. Certain practices have become unendurable. These Mr. Hoover illustrated by considering one single material—lumber. He was informed by leading manufacturers that the time had come when they must have guarantees against short deliveries and fraudulent alteration of qualities, so that the product of the honest miller may reach the consumer as the manufacturer wishes his product to reach the consumer. Mr. Hoover called for the encouragement of certain statistical work handled by trade associations and the cleaning up of certain other works of this kind that are considered by the courts as restraint of trade.

Mr. Hoover called for the removal

of every restraint upon effort in organized labor. He drew attention to the truths that the volume of employment is not increased by restraint upon effort and that the standard of living of all the people is the simple quotient of the commodities and service we produce. The more we cheapen the production of the commodity, the larger the number of people who can obtain it. Restriction upon effort in the building trade simply leaves building to the wealthier fraction of our people, making difficult the realization of one of our American ideals—that of home owning by the people. Labor should realize that only full effort will bring full recompense. Mr. Hoover includes those who work in hard collars as those who work in soft collars in the term "labor."

Mr. Hoover devoted considerable time to commending the efforts of many manufacturers toward simplification and standardization of their products, and stated that these efforts do not need to trespass the field of variety or style, nor to undermine the distinction of the manufacturer, and can be accomplished in no way except through the voluntary action of the associations and cooperative effort. All of which brought his talk around again to the subject of associations.

Mr. Hoover stated his belief in associations. He recognizes in them necessities in our growing economic life. They make for stability and economy in industry and their two greatest fields of usefulness lie in the lifting of moral standards in these trades, and in increased efficiency in production and distribution.

Live Agstone Meet

Columbus Sessions of Producers Very Interesting

On Wednesday, April 12th, the members of the National Agstone Association met at the Deshler Hotel in Columbus, Ohio, to listen to some well-known speakers pay tribute to "Agstone, the Magic Stone."

In the morning the executive committee met to transact the regular business of the organization. The chairman, J. C. King,, presided. After the reading of the minutes of the preceding meeting, and the submitting and approval of the financial report, there was considerable discussion along lines of interest to the membership.

It was decided that Mr. Hoagland should consider the application of the Jeffrey Manufacturing Company for associate membership in the Association, and determine the amount of that company's dues for the year. On motion of Mr. Kanengeiser, the president and secretary were advised to act freely in the matter of securing associate members.

There was read a letter from Mr. C. R. Wagner, who drew attention to an item appearing in the *Ohio Farmer*, which referred to the lime demonstration program conducted jointly by the county agents in twelve counties, the College of Agriculture and the Baltimore and Ohio Railroad. Mr. Wagner stated that he would be willing to devote some time during the coming summer to promoting the use of agstone.

The Grove City Limestone Co., of Grove City, Pa., represented at this meeting by Mr. Harry J. Filer, Jr., applied for membership in the National Agstone Association. The application was unanimously accepted, and the company permitted to fix the amount of its own dues.

Mr. Brandon and Mr. Colgan reported the co-operation of the Baltimore and Ohio, and the New York Central Lines, in furnishing free agstone and free transportation for limestone demonstrations in the twelve counties.

After the transaction of a number of items of business, the meeting adjourned.

With the president, E. H. Lamkin, and the chairman, J. C. King, presiding, the National Agstone luncheon was an interesting and successful event. It was attended by a large number of men interested in agriculture and the promotion of the use of limestone as a move in the right direction. After eating, there was free discussion by all present on a large number of topics. The speakers list contained the names of a number of men who are the best qualified in the country to discuss agstone and all the features of its manufacture, handling, distribution and application. Chief among these honored guests was Dr. Chas. E. Thorne, who 25 years ago discovered the various uses of agstone, and has since made important contributions to the program encouraging its use.

Prof. Firman E. Bear, chief of the Soils Department of the Ohio State University stated that work must be done along the lines of convincing the farmer that he should not wait to use agstone until his fields had become so acid as to show very marked effects when lime is used.

Mr. F. L. Allen, state director of the Farm Institutes, said that he had received many more requests than ever before from county agents and Farm Institute officers throughout Ohio for speakers thoroughly qualified to discuss agstone at next winter's Institute. Mr. Allen has recently visited every county in Ohio, and held conferences in many places for county agents and Farm Institute officers. As a result he is very closely in touch with the situation.

A departure from the topics that usually mark an agstone meeting was made when Mr. O. E. Bradfute, president of the State Farm Bureau Federation, spoke of the present certainty that live stock grown on limestone soil or soil treated with limestone showed a marked excellence of quality over animals grown on other soils. He spoke of experiments now being conducted by the State Experiment Station at Wooster where he saw a diet seasoned with agstone and fed to hogs bring the condition of these animals much higher than that of animals fed with the same quantity of the same kind of food with the exception of limestone.

The 900 Ohio Granges which last year held over 21,000 Grange meetings are active promoters of the use of agstone, according to Mr. Harry A. Caton, master of the Ohio State Grange. He said that the Grange had been teaching and preaching the need and value of the "magic stone" for quite a number of years, and that during the next year the subject would be discussed in practically every Ohio Grange. Mr. G. R. Lewis, State Grange lecturer, asked if the Association would supply him with agstone facts and figures with which to answer more thoroughly the questions on agricultural lime and limestone he was getting from his Grange lectures.

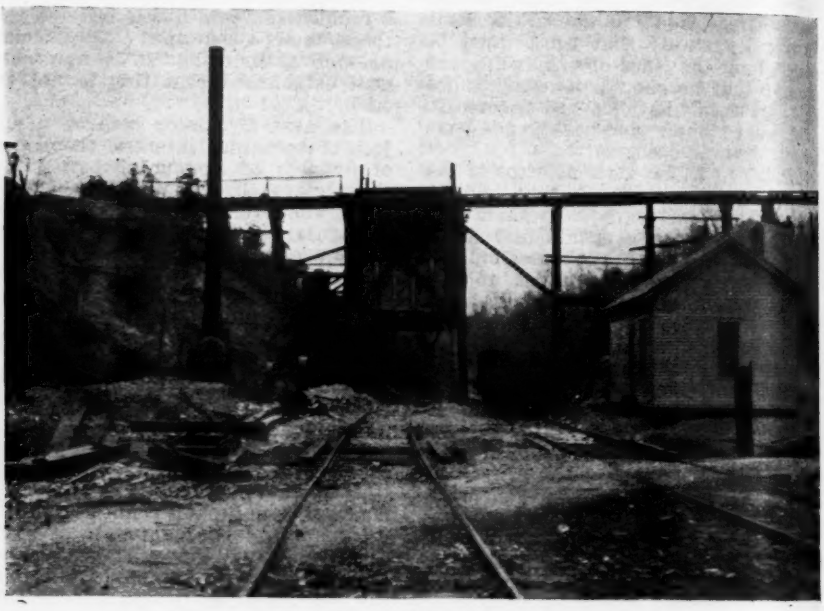
An interesting report on nearly 15,000 tests for acidity made on soil in western Ohio, was quite interesting. This report, made by Prof. Salter of the College of Agriculture and by Mr. H. A. Brandon of the Agstone Association, showed that the application of agstone or plant lime would benefit much of the soil of western Ohio. For a number of years it was believed that these soils contained a sufficient amount of lime, but it is now quite well established that this is not the case.

The next discussion was on a subject of perennial interest, the degree of fineness of agstone that will give the most satisfactory results. As is usual whenever this topic comes up for consideration, there was considerable difference of opinion. At the request of Mr. Kanengeiser, Mr. Hoagland, Mr. Brandon, Mr. King and other manufacturers, the State Agricultural College will be asked to determine the best form in which to manufacture agstone, and to tell the manufacturer to what degree of fineness agstone should be pulverized.

Considered as a whole and in each of its parts, the meeting was a distinct success and, as all such meetings prove to be, broadly educational. It was pervaded throughout by a spirit of co-operation and fairness, and an earnest desire to confer benefit upon the agricultural resources of the country, as well to help the individual manufacturer of that most remarkable of stones, agstone.

Elutriative tests have been made at the Southern Experiment Station of the Bureau of Mines, Birmingham, Ala., on certain materials, such as silica, tripoli, bentonite, fuller's earth waste, infusorial earth, ocher, slate flour, whiting, talc, pyrophyllite, and mixtures of non-metallic minerals. Microscopic slides have been made for the purpose of counting the grains. An air separator has been devised for the classification of finely ground materials. Oil absorption tests have been made on several ochers, on marble whiting, and on clays under varying degrees of temperature. A color scheme has been prepared for the comparison of clays. It has been shown that the lower grades of graphite can be purified by the Trent process, thus rendering them suitable for lubrication purposes.

The Knoxville Sand & Lime Co., Utica, N. Y., has filed a charter for $50,000. The company will engage in furnishing sand and lime for construction and building work. Incorporators: Milton McDermott, Malcolm McDermott, J. R. Long, R. O. Ryan and T. T. Johnston.



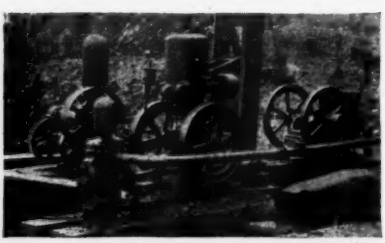
Loading and Crushing Equipment and Water Pumps

Supplying Road Metal

Memphis Stone and Gravel Co. Has Good Output at Pit in Camden, Tennessee

FROM its plant at Camden, Tennessee, the Memphis Sand and Gravel Company ships each day about 50 cars of material for use in building gravel roads considerable distances away, shipments frequently extending down into Mississippi.

At the Camden plant the company is working a deposit that covers some 60 acres. There is also in reserve a large hill in which is located an enormous gravel deposit. The gravel is very high grade and has very little variation, a small chalk pocket encountered some time ago being an unusual experience.



Water Line Pumping Equipment

The first operation that is necessary to get material from the Camden pit, is the drilling of a five inch blast hole 69 feet down, the full depth of the face, which runs in an irregular way for a length of a couple of hundred feet. A Sanderson Cyclone drill is used for this operation. Blasting is necessary about every four days.

After the material has been blasted down, it is loaded by a No. 92 Marion steam shovel with a 5-yard dipper, into 5-yard cars, of which there is a fleet of twenty, and which are hauled from the shovel to the screen by an 18-ton Porter locomotive.

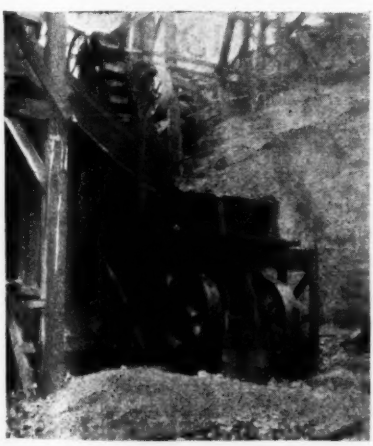
The material, on reaching the tipple, is dumped to the left if intended for screening, and to the right if intended for use as pit-run material. The

process of screening consists of passing the material over three sets of bars, spaced 4½ inches, 2 inches, and 1¾ inches respectively. From the pit-run side of the tipple, there is only a set of 4½ inch bars to eliminate oversize. Oversize from both sides is passed by chute to a No. 4 Champion belt driven crusher. From this machine it is re-elevated by a continuous bucket conveyor, 16 feet high, with buckets twelve inches wide. This piece of equipment is also belt driven.

Marion 92 Shovel and 18-Ton Porter Locomotive

Loading tracks are located under and to one side of the bins. There is a tail track with a capacity of 23 cars from which empties are dropped down by gravity for loading.

The crusher and elevator are powdered by a 25 h. p. Johnson steam engine driven by a boiler mounted alongside.



Champion Crusher for Oversize

On the hill from which the gravel is being removed is located a 10,000 gallon water tank which is kept supplied by a Fairbanks-Morse pump of 1,000 gallons per hour capacity and by a Novo pump, both of which are driven by gasoline engines. From this tank the boilers of the engine, steam shovel and locomotive are watered.

Season Opened Early

March Broke Record of Building Operations in Louisville

By Our Louisville Correspondent

The spring season opened early and enthusiastically in Louisville for the sand and gravel people, and though some high water in the river interfered for a while with digging operations, this did not hurt much because all the local yards had enough in stock to serve their needs.

All records of building operations were broken in Louisville in March, and April kept up the pace, so that on all sides we find the sand and gravel people busier than usual and fairly enthusiastic about the prospects for the year. The carload trade with dealers out in the state and road building projects has not gained big headway yet, and like the crushed stone business it is hampered some by high freights. It is getting under way, though, and on the whole promises to be of normal volume, and probably even better than that.

It is pretty busy times all around with the sand and gravel division. The quarry folks are the only ones who complain of dull times yet, and they lay most of this trouble to the high freight rates which have curtailed the commercial business. There is a fair amount of quarry business on

railway contracts, and local quarrying on road building contracts, and this is all getting under way nicely now. Also there are several new road contracts to be let early in May, which it is hoped will add some to the quarry business and help keep up the good work of road building, which also makes sand and gravel trade.

The Ohio River Sand Co., reports that they had to let up on river work for a while because of high water, but they are back at work again in good shape now, and meantime they had enough stock on hand to take care of their needs. On the whole, they take a very cheerful view of the outlook ahead, and they find that the local spring business started off rather early and in good shape.

The Nugent Sand Co. has its new elevator plant in good shape now, and reports prospects bright. They let up on sand digging for a short time recently to unload and store several barges of nails, wire and other material for the American Steel & Wire Co., which has a local warehouse on their ground, and which barged down quite a stock from Pittsburgh last month. The Nugent boys say that it looks like good business and a busy season all around with them.

J. E. Lloyd, of the Louisville yard of the E. T. Slider Co., says they burned out their hoisting motor which delayed them several days around the middle of April and caused them to fill some carload orders out of the yard, which should have been handled direct. Meantime they had put their jumbo digger to work in the river again, and during the period of repairs at the Louisville yard it confined its unloading operations to the New Albany yard. They report both local trade and carlot business doing fairly well, and see indications pointing toward it being a good season with everybody busy.

The Louisville Times in its thumbnail sketches of builders of Louisville has this to say about Dexter Belknap:

"Coming to Louisville from Buffalo, N. Y., during the Civil War with Bartin & Robinson, builders of the Louisville & Portland Canal, Dexter Belknap soon became one of the foremost business citizens of the community. He organized the Falls City Cement Company, afterward the Union Cement & Lime Company, in 1866, and the Utica Lime Company, in 1879, brought the first steam road roller to Louisville, and founded the Salem Bedford Stone Company.

Portland Cement in 1921.

Preliminary estimates by the United States Geological Survey, given in the following table, show that the production of portland cement in 1921, 98,293,000 barrels, was more than 98 per cent as great as that in 1920, the "record" year.

The total shipments in 1921, about 95,051,000 barrels, were nearly 99 per cent of those in 1920.

The stock of finished cement at the mills at the end of 1921, about 11,938,000 barrels, showed an increase over the stock at the end of 1920 of more than 33 per cent. This stock exceeded the average stock in hand at the end of each of the years 1917 to 1921 by over 27 per cent.

The average factory price in bulk at the mills for the whole country was $1.87 a barrel in 1921, as compared with $2.02 a barrel in 1920, a decrease of 7.4 per cent.

The accompanying tables show by districts the actual production, shipments, value, and stocks of portland cement for 1920, and give estimates of the same items for 1921.

Portland cement produced, shipped, and in stock in the United States in 1921, by districts, and corresponding totals for the United States in 1920.*

Commercial district	Production		Shipments		
	Quantity (barrels)	Stock at end of year (barrels)	Quantity (barrels)	Value	Average factory price per barrel (excluding cost of container)
Lehigh district (eastern Pennsylvania and Western New Jersey)	23,648,000	2,818,000	22,933,000	$39,674,090	$1.73
New York	5,295,000	736,000	5,040,000	9,576,000	1.90
Ohio and western Pennsylvania	9,055,000	967,000	8,819,000	15,256,870	1.73

Michigan and northeastern Indiana ...	6,189,000	806,000	6,099,000	11,039,190	1.81
Illinois and remainder of Indiana	14,939,000	1,859,000	14,413,000	24,213,840	1.68
Maryland, Kentucky, Virginia, and West Virginia	4,604,000	490,000	4,482,000	8,202,060	1.83
Alabama, Tennessee, and Georgia	4,220,000	312,000	4,097,000	7,948,180	1.94
Iowa, Minnesota, and Missouri	10,519,000	1,814,000	9,959,000	17,627,430	1.77
Kansas, Nebraska, Oklahoma, and Texas.	8,438,000	1,079,000	8,018,000	17,799,960	2.22
Colorado and Utah ..	1,865,000	204,000	1,826,000	4,254,580	2.33
California	7,073,000	502,000	6,934,000	16,294,900	2.35
Washington, Montana, and Oregon	2,448,000	351,000	2,431,000	6,101,810	2.51
1921, Total	98,293,000	11,938,000	95,051,000	177,988,910	1.87
Percentage of change in 1921	—1.7	+33.0	—1.3	—8.5	—7.4
1920, Total	100,023,245	8,941,046	96,311,719	194,439,025	2.02

*Figures for 1921 are based to a large extent on reports of producers of portland cement but in part on estimates and are subject to revision.

Portland cement produced, shipped, and in stock in the United States, in 1920, by districts.*

Commercial district	Production		Shipments		
	Quantity (barrels)	Stock at end of year (barrels)	Quantity (barrels)	Value	Average factory price per barrel (excluding cost of container)
Lehigh district (eastern Pennsylvania and western New Jersey)	25,417,804	2,086,370	24,953,127	$47,875,881	$1.92
New York	5,885,058	553,989	6,049,150	12,206,698	2.02
Ohio and western Pennsylvania	7,343,112	752,582	6,943,400	13,414,249	1.93
Michigan and northeastern Indiana	5,379,187	727,927	4,922,329	11,892,249	2.42
Kentucky and southern Indiana	3,293,090	326,193	3,069,407	6,248,406	2.04
Illinois and western Indiana	13,106,011	1,094,358	12,321,840	22,561,398	1.83
Maryland, Virginia, and West Virginia..	3,044,691	256,476	2,912,308	6,128,117	2.10
Tennessee, Alabama, and Georgia	2,888,811	191,319	2,730,420	6,010,436	2.20
Iowa, Minnesota, and Missouri	12,406,745	1,261,131	11,511,954	22,259,081	1.93
Nebraska, Kansas, Oklahoma, and central Texas	8,177,245	727,726	7,900,247	17,110,729	2.17
Rocky Mountain States (Colorado, Utah, Montana, and western Texas)	3,764,502	251,236	3,734,784	8,316,576	2.23
Pacific Coast States (California, Oregon, and Washington) ..	9,316,989	711,739	9,262,753	20,415,205	2.20
	100,023,245	8,941,046	96,311,719	194,439,025	2.02

*The State grouping differs somewhat from that given in the preceding table.

Big Production in East

Every Indication of Prosperous Season Ahead

By Our Eastern Correspondent

Increased production and increased sales are following the advent of spring in the sand, gravel and crushed stone markets in the eastern districts. Decided impetus has been given to the situation by the turn of the first quarter of the year and the encouraging outlook for the months ahead when seasonal weather will insure firm and active demand. The opening of the real construction year finds local producers in good position to supply the call, with market stability of growing strength from week to week.

Road-building is destined to form a big feature of sales in the industry during the coming months. States, counties, cities and towns are arranging construction programs in this line calling for thousands of tons of material for early delivery. Cow Bay sand, first grade washed gravel, selected crushed stone, and Portland cement are being specified in large quantities for road work. Producers, as well as dealers, size up the situation with no mean satisfaction. Heavy sales and large distribution are in immediate prospect.

Prices are showing but slight fluctuation, and the general average holds quite firm to the prevailing levels of recent months. There seems to be but little question in regard to the outlook in this direction, for existing figures are expected to hold with only fractional variations in the active weeks ahead. At New York, Portland cement shows a trend to higher levels, while crushed stone has developed a change in the opposite way.

With regard to the latter, the New York market quotes $1.65 for 1½-inch material, and $1.75 for ¾-inch stock, in wholesale quantities, as against $1.75 and $1.85 a cubic yard, respectively, a month ago; a year ago, the larger size material was selling in cargo lots for $2.00, and the smaller size for $2.15. Dealers continue to quote $4.00 for crushed stone, either size, delivered.

In wholesale quarters, good grade sand remains firm at $1.00 a cubic yard, wholesale. Supply dealers are asking $1.80 for the material delivered on the job, while white beach sand continues at $5, delivered.

Fine washed gravel maintains at $1.75 a cubic yard in cargo lots, both 1½ and ¾-inch sizes, and there is marked firmness in this level. Supply yards are given rather varying quotations on the material, ranging from $3.00 to $4.00, delivered on the job.

Portland cement has advanced from $2.00 to $2.30 a barrel for contractors and dealers in cargo lots, alongside dock, attaining quite close to the level of $2.40 for the material under similar delivery prevailing a year ago. The delivered price to contractors has been increased from $2.30 to $2.40 a barrel, wholesale quantities. Material dealers are holding to the figure of $2.80 a barrel, delivered, with bag rebate of 10 cents, but an early advance to $2.90 and possibly $3.00 is rather anticipated as new stocks are purchased and accumulated.

There are practically no changes in quotations on lime. Common lime is standard 300-pound barrel is being delivered by dealers at $3.75 a barrel; finishing material, same size container, at $4.50. Hydrate common is being retailed at $19.50 a ton in paper, and hydrate finishing at $24.00 a ton. The latter material in the wholesale market is selling for around $16 and $16.50 a ton, while common lime is quoted at $12.50 a ton at the warehouse.

The Hoosac Valley Lime Co., North Adams, Mass., has plans under way for the rebuilding of the portion of its plant, destroyed by fire on March 20. The pulverizing and hydrating departments sustained the greatest damage. William Flaherty is president.

The Central Falls Stone Co., Central Falls, R. I., has filed notice of a decrease in capital from $50,000 to $20,000.

Following a strike of employes in the different quarry centers of New England, due to a reduction in wages, a number of plants have resumed operations, and the majority on the open-shop basis. Among these, the John Swanson granite quarry at Concord, N. H., is now working with a good force of men, and other quarries in this same district are maintaining good outputs.

The M. McDonough Co., Swampscott, Mass., has acquired the sand and gravel properties of the Eastern Massachusetts Street Railway Co., on the Lynn Road, near Salem, Mass., and plans to operate at this location.

The main pit has an area of over 18,000 square feet.

The Bewley-O'Reilly Co., Lockport, N. Y., has been organized with a capital of $10,000, to operate a stone quarry in this section. The company is headed by G. C., I. G. and W. E. Bewley; it is represented by W. A. Gold, Lockport.

The United States Gypsum Co., 1170 Broadway, New York, will soon commence the erection of additions to its plant at Oakfield, near Batavia, N. Y., for increased production. The work will include a main extension, 50x600 feet, and adjoining building, 50x100 feet. The company has recently completed the construction of a bunk house and mess hall for employes, and is now giving work to about 900 men. In addition to the manufacture of finished gypsum products, the plant is shipping on an average of 200 tons of raw gypsum daily to other manufacturing plants.

The Corning Stone Corporation, Corning, N. Y., has been incorporated with a capital of $10,000, to operate a crushed stone business. The company is headed by R. O. Hayt, C. E. Smock and R. C. Davison. It is represented by H. A. Heminway, Corning.

The Wickwire Limestone Co., Gasport, N. Y., is arranging for the rebuilding of the portion of its plant recently destroyed by fire, comprising two structures, 40x60 feet, and 30x50 feet, devoted for the most part to crushing the kindred operations. The loss is estimated at close to $50,000, including equipment.

The LeRoy Lime & Crushed Stone Corporation, LeRoy, N. Y., is maintaining active production at its plant, and is making a number of extensions to provide for increased operations during the spring season. New switch tracks will be laid across the Perry Road for heavier shipments.

The Transit Sand & Gravel Co., Lockport, N. Y., has filed notice of dissolution under state laws.

F. W. Schmidt, Inc., Morristown, N. J., operating stone quarries, has been organized under state laws with a capital of 1,000 shares of stock, no par value, for extension in operations, to include sand, gravel and affiliated products. The company is headed by Frederick W. Schmidt, 17 South Street, Morristown.

The Alliance Hollow Cement Block Co., Palmerton, Pa., has construction under way on a large sand washery, and will place the plant in service as soon as completed.

The Northampton Quarrying Co., Northampton, Pa., has resumed operations at its plant, following a shut down for a number of months. Employes will work on a full time basis for an indefinite period.

A big feature of operations in the industry in Pennsylvania at the present time is the resumption of production of the slate quarries in the eastern section of the state, and the situation holds out encouraging aspects in the months to come. Good sized orders are being booked, and heavy output will be maintained for an indefinite period. A number of plants in the vicinity of Bangor, idle since the war, will re-open at an early date, while others have already started up. The Big Four Slate Co., operating at the old Cambridge quarry at Slatington, has been busy installing new electric pumping machinery and other equipment. The Cambridge Slate Co., in this same place, has also been making repairs to boilers and other equipment at its works. The Carbon Slate Co., Emerald, near Slatington, is making improvements at its local plant, with repairs to equipment, and will resume active operations at an early date; the plant has been closed for a few years past. The Washington Quarry Co., Slatington, is making ready to work under heavy production at its local plant, one of the largest in this district; a big working force will be employed. The majority of these quarries will work on a 10-hour day basis until further notice.

The Ross Solid Stone Sand Co., Allens Mills, Pa., has been organized under state laws with a capital of $10,000, to operate a sand and gravel plant in this section. J. H. Burtop, Reynoldsville, Pa., R. F. D. No. 4, is treasurer.

Robert and Morris Hughes, Slatington, Pa., are arranging for the immediate opening of a new slate quarry on the Kern property, near Slatington. It is expected to strike the Cambridge vein of slate, and extensive production is planned. A completely equipped plant will be provided.

The Spring Brook Sand Corporation, Scranton, Pa., has been organized with a capital of $5,000, to operate sand and gravel properties in this district. Adolph Marcus, Scranton, is treasurer.

It Pays to Standardize

Government Says So, and Pit and Quarry Operators Know It

Standardization of numerous products of the different non-metallic mineral industries should greatly reduce the cost of manufacture and eliminate much waste, according to Oliver Bowles, mineral technologist of the United States Bureau of Mines. The necessity for the elimination of superfluous varieties and the bettter standardization of essential products is already being recognized by many manufacturers, says Mr. Bowles.

It is customary for manufacturers of structural slate to prepare it in sizes specified by builders and architects. Thus the material cannot be manufactured in advance. This results in irregular activity of mills and delays in filling orders, and may force manufacturers to use raw materials that might be better adapted for products other than those called for in the orders. To improve this condition, one of the slate producing companies of Pennsylvania, has issued a series of pamphlets giving complete specifications of structural slate for various purposes. Architects find it so much easier to order slate from these sheets that, in preparing plans for new structures, standard sizes are specified. Slate producers will probably shortly be enabled to build up a reserve stock of standard sizes, which will be advantageous both in marketing and in manufacturing.

Slate switchboards are likewise usually manufactured after the order has been received. The most serious objection to the filling of order directly from the quarry is that freshly quarried slabs have only about half the resistance in ohms of the same slabs after drying out for three months. One Chicago manufacturer claims that 80 per cent of all switchboards are of standard sizes, and he keeps such sizes in stock. The facility with which orders may be filled from stock, and the improved quality of seasoned switchboards, will undoubtedly, influence electrical companies toward a more uniform standardization in size. Simplicity could be further attained by the elimination of minor irregularities in style, as for example in the beveled edges.

The Bureau of Mines has noted similar tendencies in the structural block, sand, gravel, and crushed stone industries. Limestone quarrymen have found it advantageous to establish a standard size for mill blocks, and large piles of such blocks are stored for seasoning before shipment to stone-cutters. Concrete blocks, artificial stone terra cotta and similar types of molded building blocks are gradually being standardized in size and shape.

Producers of sand, gravel and crushed stone have been greatly handicapped by the varied requirements of consumers. Construction engineers differ widely in their views as to the sizes of crushed stone, sand and gravel best suited for their requirements, and thus demands have arisen for a multiplicity of sizes necessitating costly and complex screening equipment. For the past two years various organizations have been striving to establish standard screens, and to eliminate all unnecessary sizes. A notable step in this direction is the preparation of a set of tentative specifications by the American Society for Testing Materials working in co-operation with the Bureau of Public Roads. These specifications call for screen openings of a limited number of standard sizes. Thus users of crushed stone, sand and gravel are encouraged to confine their orders as far as possible to standard sizes, with a consequent tendency toward simplification of equipment and reduced production cost.

Granite paving blocks are manufactured in a great variety of sizes. Eleven varieties sold under trade names, were reported in 1917, and many other varieties were sold by sizes only. The State of Maine reported 7 different sizes, New York 7, Massachusetts 10, and other states a varying number. Undoubtedly some latitude should be allowed in paving block dimensions, particularly in length, but too great a complexity is involved both in manufacturing and in street construction.

Feldspar is standardized neither as to grain sizes nor purity. Specifications may call for fixed percentages of soda and potash or such requirements may be omitted. Ground feldspar is commonly reduced to 140-mesh, but there is no standard requirement in size.

Await I. C. C. Decision

Gravel Producers See Future of Industry Threatened

By our Washington Correspondent

At the offices of the National Sand and Gravel Association, T. R. Barrows, who is acting as secretary since the resignation of E. Guy Sutton, stated that the association is "marking time" pending the decision of the Interstate Commerce Commission on railroad rates.

The association has placed all of its arguments and complaints before the commission with the exception of an oral argument which will be made on May 22, when the complaint of the central states territory will also be laid before the commission. The decision of the commission on rates is looked upon by officers of the association as being the most important matter with which sand and gravel producers are now concerned. In fact, they feel that the future of the industry depends very largely on the decision of the commission.

The executive committee of the association met here on April 13, but it is not being announced what subjects were discussed. It is presumed, however, that the pending rate decision was the principal topic. Those who attended the meeting are: Alex W. Dann, president; John Prince, treasurer; V. O. Johnston, former president and now director of organization; Hugh Haddon, Jr., and C. L. Ruffin. vice-president, George J. Nattkemper and A. P. Burke were unable to attend.

In connection with the effort of the association and other organizations to obtain a lower rate for shippers, it might be well to state that the railroads are making a hard fight against reductions. Daniel Willard, president of the Baltimore and Ohio, and other railroad presidents have appeared before the commission and fought step by step every effort to reduce rates at this time. They have endeavored to show that any reduction now will mean the loss of millions of dollars to the railroads, and will prevent the roads from making needed improvements and extensions and the purchase of necessary rolling stock. What the commission will do no one can forecast.

A steady supply of surplus war material suitable for highway construction is being distributed to the States by the Bureau of Public Roads, Department of Agriculture, which acts as a clearing house. A force of about 275 persons is kept in the field taking inventories and preparing material for shipment. Lists of material available are sent to each State highway department, and a period of 30 days allowed for the submission of requisitions The material is allotted to the States on the same basis as monetary Federal aid for road construction, a value being placed on each item and a record kept of the total value received by each State. Up to February 1 of this year the value of the materials thus distributed amounted to $126,000,000, of which $90,000,000 represented the value of motor vehicles and parts.

Recently an inventory was taken of about $40,000,000 worth of material at Camp Grant, Rockford, Ill., part of which will be retained by the War Department and the remainder, suitable for road work, soon will be available for distribution. The work is being rushed, so that the material may be used for road work early in the season and the camp cleaned up by August 1. Other surplus war materials recently received for distribution and located at Schenectady, N. Y.; Watertown, Mass., and Dover, N. J., include 200 carloads of brick, about half of which is suitable for highway paying; 5,000,000 pounds of nails, 1,000,000 pounds of staples, 1,000,000 square feet of concrete reinforcing mesh, 200,000 monkey wrenches, and 133 carloads of picks and pick handles.

A great deal of valuable data on highway construction are soon to be made available to all persons connected with highway development by the bureau. In its supervision of large appropriations by Congress for Federal aid road construction, the bureau has assembled complete records of contract prices for all types of roads in all sections of the country since 1916. In addition, engineers of the bureau operating in each of the 48 States report monthly on labor and material used on jobs inspected by them.

To put this information in the most suitable form statistical machinery has been installed and the work so arranged that a small force can make available a great variety of information at a small percentage of the cost

of such work when done by hand. The data assembled will consist of monthly reports on the status of Federal-aid work, prices paid for labor, and contractors' bids for new work in all sections of the country. From time to time reports covering a large volume of work will be made on costs of various types of surfacing and grading, percentages of various types of roads built, proportion of total cost which goes into grading, surfacing and other items of construction, together with any other information for which there may be need.

In connection with the data on cost of labor, it is stated by the bureau that labor prices for road work still continue to decline in all parts of the country. Prices paid for common labor in February decreased slightly more than 1 per cent per hour below those paid in January, the average prices for the whole country being 29 and 28 cents an hour, respectively, in the two months. Prices paid for skilled labor also showed a general decline. In February the price of common labor ranged from 13 to 20 cents an hour in the Southern States, 23 to 30 cents an hour in the Middle Western States, and around 45 cents an hour in the Pacific States. The prices of teams without drivers ranged from 24 to 42 cents an hour.

It is also stated that early bids for the construction of Federal-aid roads indicate that prices during the coming season will be materially lower than last season. While bids have not been received on any large volume of work, there is, however, enough to indicate a lower level of prices. This is thought to be due in many instances to a better and cheaper labor condition.

Road building has now become one of the nation's largest industries, according to statistics compiled by the bureau, and surpasses such great industries as the manufacture of steel and iron as well as the production, sale, and repair of automobiles. In December, 1920, less than 600,000 men were employed in the steel and iron industry. It is estimated that last year something like 750,000 men were engaged in making, selling, and repairing automobiles. As compared with this an army of approximately 1,000,000 men labored last year throughout the road-construction season in building and repairing the country's highways.

Fifty million tons of stone and gravel will be required by the 28,000 miles of Federal-aid roads either completed or under construction in the United States at the end of the present fiscal year, according to the estimates of the bureau. Some idea of the quantity is given by the fact that it is equal to a million carloads. If the material were piled in one place in the form of a cube it would be approximately 1,000 feet in each direction, or nearly twice as high as the Washington Monument.

Rates On Lime

Admitted inconsistencies in the adjustment of lime rates in central and eastern line territories, Examiner I. L. Koch thinks, would be removed by the adoption of a recommendation made by him on No. 13014, Lehigh Lime Company vs. Akron, Canton & Youngstown et. al. Koch, in his report, recommended a holding that rates from Mitchell, Ind., to destinations in central territory, particularly to destinations in Pennsylvania, West Virginia, Ohio, and Michigan, are and will be unreasonable to the extent they exceed or will exceed 83.33 per cent of sixth class rates in effect June 24, 1918, plus the increases authorized in General Order No. 28 and Ex Parte 74.

As to rates from Mitchell to the same destinations in comparison with rates from competing points in trunk line territory, he recommended a holding that they are and will be unduly prejudicial to complainant and unduly preferential to its competitors in Buckeystown, Frederick and Lime Kiln, Md., Bakerton and Eagle, W. Va., Stephens City and Strasburg, Va., and York, Pa., to the extent they fail to bear a relationship to the rates from those points in trunk line territory to the same destinations expressed by the ration of 83.33 per cent of the corresponding sixth class rates in effect June 24, 1918, plus the general increases in General Order No. 28 and Ex Parte 74; and 70 per cent of the corresponding sixth class rates in effect June 24, 1918, plus the general increases, from the trunk line points mentioned; except that on lime containing a substantial residue of foreign matter, somewhat lower rates may be maintained.

The high-calcium chemical lime produced by the complainant at Mitchell was used for purposes of the case.

—*Traffic World.*

Frank Farrington's Business Talks

No. 5—Interest

How much money have you paid out in interest since you went into business?

Sit down and figure it up as closely as you can.

It may have been the annual interest on one thousand or on ten thousand dollars.

You may have been paying for one year or for fifty years.

Somebody has been putting that money into his pocket as income, as a return on investment.

It has been coming out of your pocket because you did not have the money you needed in your business, and possibly the reason you did not have the money is because you have spent it too freely.

The young man gives little thought to interest.

To him it is merely the necessary evil attendant upon borrowing, and as he has to borrow to accomplish what he wants to accomplish, he thinks nothing of paying the interest charge.

If we would think more about interest and how it counts up, we would develop more enthusiasm about getting it to coming our way, for getting it coming in instead of going out.

Some men put their interest in with their other expenses and at the end of the year there is no separate interest item standing out by itself to show what the year's interest payments have been.

Try keeping your interest payments separate and footing them up at the end of the year.

You will find yourself seriously considering what a lot of desirable things might be bought with that sum of money if you had been able to keep your hands on it.

Set yourself about cutting down the interest charges as much as you can and as fast as you can.

Make your plans to get out of the interest paying class and into the interest receiving class.

When a man begins to receive interest he has things started his way and if he does not accumulate some degree of wealth, he has only himself to blame.

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Ind.-Ill. Cement Rates

And Many Other Items of News From the Hoosier State

By Our Indianapolis Correspondent

At a meeting of a committee of the Central Freight Association and of western trunk line carriers east of the Missouri river with John W. McCardle, chairman of the Indiana public service commission, and A. B. Cronk, attorney for the commission, proposed increases in cement freight rates in Indiana and Illinois and proposed changes in interstate cement rates between the two states were considered. Mr. Cronk said the proposed change was submitted by the carriers and contemplates a slight reduction in interstate rates, an increase of about 60 per cent for the most part in Indiana intrastate rates, and a greater increase for Illinois rates. He said the short haul Indiana rates would not be affected if the proposed change were to become effective. The carriers' proposal is to base all interstate and intrastate cement rates on the Lorenz scale, plus 2 cents per 100 pounds, plus 35 per cent. The interstate scale is now the same with the exception of the percentage which is 40. Mr. Cronk said the commission might be inclined to look with favor on the proposed scale if rates in Illinois are made equitable with those in Indiana. It was said that the carriers would wage their campaign for the proposed new level before the interstate commission, but they wished the indorsement of the affected state commissions.

T. E. Bond, of Chicago, assistant traffic manager of the Elgin, Joliet & Eastern Railroad, headed the committee, and Ralph Norris, assistant general freight agent for the Lake Erie & Western Railroad, was the Indianapolis, member of the committee.

U. S. Lesh, Indiana attorney-general, said recently that the state will bring no action at this time against cement manufacturers alleged to have applied trust methods to cement business in Indiana. He said the fact that no present action is contemplated does not mean that the state may not take action against the companies later.

The attorney-general said he will present to the United States district attorney at Chicago the information the state has, and will collect information supporting its belief that there is a cement trust. Mr. Lesh said he has evidence supporting his belief outside of what came to light in the recent experience of the state highway commission with the companies. The Chicago district attorney has begun federal action against a number of cement companies and, Mr. Lesh said, would be able to deal with the situation in an interstate way.

The program of the state was formulated at a conference Mr. Lesh held with Governor McCray, and conforms to the governor's wishes, it was said. The companies with which the highway commission dealt recently in buying approximately $500,000 worth of cement were the Universal Portland Cement Company, of Chicago; Lehigh Portland Cement Company, Chicago; Indiana Portland Cement Company, Greencastle; Atlas Portland Cement Company, Chicago, and Wabash Portland Cement Company, Detroit. The first three of the companies submitted identical bids for certain of the state's business. The state rejected all of the bids, and since has bought cement at a considerably reduced price from the Marquette Portland Cement Company, of La Salle, Ill. All the companies were indicted by a federal grand jury in Chicago this week for alleged trust methods.

Suit was filed recently against the Bedford Stone Club Auxiliary, Inc., charging existence in Indiana of an unlawful combination of companies which control the quarrying and sale of Indiana limestone, and asks for permanent injunction preventing a continuance of the alleged "combination and conspiracy" and that the corporate charters and franchises of the companies be revoked, and that receivers be appointed. Arthur W. Stone, of New York City, recently entered his appearance in the case for the Hoosier Cut Stone Company and the George Doyle Corporation. Pickens, Moores, Davidson & Pickens, of Indianapolis; Clark & Brooks, of Bedford; Louis E. Hart and James E. Wilkerson of Chicago; also filed appearances representing the International Cut Stone Contractors and Quarrymen's Association, Inc.; Imperial Cut Stone Company, Central Oolitic Stone Company, Consolidated Stone Company, J. R. Falt Company,

Furst-Kerber Cut Stone Company, J. Hoadley & Sons Company, Interstate Cut Stone Company, Matthews Brothers Company, Perry Stone Company, John R. Rowe Cut Stone Company, Shea & Donnelly Company, Henry Struble Cut Stone Company, Hoosier Cut Stone Company, C. Ittenbach Company, and Edward F. Dux. The suit was filed recently in Superior Court in Indianapolis by Attorney-General U. S. Lesh.

The Terre Haute, Ind. board of public works in charge of street repair and construction work, has developed a system whereby it is estimated that a large amount of money may be saved yearly in the purchase of street materials. The plan will be tried out at an early date. The city school trustees have granted the board of works the use of a railroad switch at the old Rose Polytechnic Institute site and space for several sheds and storage houses. The board plans to buy sand, gravel, concrete, asphalt and other materials in carload lots and to store the materials at the switch until needed. Purchase of such materials in large lots will effect a large reduction in the cost of street and sidewalk work, William Norcross, president of the board of works, believes.

A. B. Meyer, president of the Mid-West Crushed Stone Company and of the A. B. Meyer Coal Company, died recently at his home in Indianapolis. He had been serious ill for more than two months and had been in ill health for more than a year. He was sixty-eight years old. He was educated in Indianapolis and Cincinnati and entered the building supply business many years ago. Becoming interested in this business, he branched out into the production end and organized the Mid-West company which produces crushed stone for building and road construction work. Mr. Meyer always has been active in organization work.

The Paducah Sand and Gravel Company has been organized at Evansville, Ind., with a capital stock of $100,000. The company plans to produce both sand and gravel. The organizers are W. C. Sanderson, Maxie M. Sanderson, S. H. Hall, Wilbur T. Murphy and D. Gibson Morris.

M. L. Mitchell recently filed receivership proveedings against the Consolidated Mica Company, whose main offices and factories are in South Bend and mines in Alabama. The company was organized through a stock sale aggregating about $150,000. Factory buildings purchased for $50,000, against which a mortgage stands of $17,000 besides the mines, are included in the assets of the company. According to suit filed by Mr. Mitchell, he declared it was impossible to collect $900 due him from the concern.

A gravel digging plant is to be placed on the Wabash river at Grayville, Ill., a few miles west of Evansville, Ind., by the Penglass Engineering Company, which has a capitalization of $50,000. The vice president of the concern is E. H. Flesher, of Mt. Vernon, and B. S. Alnutt, cashier of the National City Bank of Evansville, is the secretary and treasurer.

The State Highway Commission recently informally discussed the secondary road system in Indiana, as included in the 1912 construction program outlined a short time ago. The commission has reserved approximately $1,500,000 for the purpose of building gravel and stone roads in the state. The commission took up locations and the type of roads to be built, but owing to the fact that no quorum was present, took no action. It has been decided that the commission will build a number of miles of secondary roads of gravel or stone. Governor McCray has let it be known that he is in favor of this type of road where the traffic is light enough to carry it.

An increase from $25,000 to $100,000 in the capital stock of the Warsaw Sand and Gravel Company of Lafayette, Ind., was made recently according to papers filed with the secretary of state.

Lime Convention

The 1922 convention of the National Lime Association will be held in Cleveland, Ohio, June 14 and 15.

The Chain Belt Company, Milwaukee, Wis., has announced the appointment of G. F. Sherratt as manager of the Pittsburgh office in the Union Arcade Building. Mr. Sherratt will be in charge of all the company's chain and engineering business in the Pittsburgh territory and is equipped to render engineering service on power transmitting and material handling problems.

In the Cement Districts

Mills Starting Big Production for 1922 Demands

The coming of spring has been the signal for a heavy advance in production at the cement mills in the Lehigh Valley section of Pennsylvania. Since the first of April shipments have taken on a large increase. Cars are in demand and do not remain on the sidings long, and in excess of 100 carloads are now moving from this district daily.

Mills at Northampton, Easton, Coplay and other parts are opening up for a big season. The larger companies already have outputs scheduled for a number of weeks ahead, showing an advance for each week throughout the spring. The smaller mills are following in the trend of the increase, and a number of these plants now have regular manufacture under way, with good-sized working forces. Labor still remains quite plentiful, and no immediate difficulty is expected on this score.

The foresight of the local cement companies in stocking up a coal supply, as mentioned in the last issue of PIT AND QUARRY, is now working out to decided advantage, and it is estimated that there is sufficient bituminous coal in this region to carry the mills for about three months. Large tonnages are still being received on recent orders.

The mill base in the Lehigh Valley section holds at $1.70 a barrel in carload lots, less bags. At Universal, Pa., the figure is $1.75 a barrel.

The Coplay mills are engaging under a good rate of production, and the Coplay Cement Co., is among the large shippers of material at the present time Mills at Egypt are commencing to resume, and the Giant Portland Cement Co., is on the active list in this district. The Alpha Portland Cement Co., is advancing production at its Easton plants, and orders are coming in for sizable shipments. The Atlas Portland Cement Co., is running its big mill at Northampton, as well as its plant in the Coplay section; the company is said to be looking forward to a high rate of manufacture throughout the months to come.

The Lehigh Portland Cement Co., Allentown, Pa., is maintaining production at its local mills in the New Castle, West Coplay and Ormrod districts, and will likely increase production in certain departments as the spring season matures. The Penn-Allen Cement Co., is active at its Allentown works, and is keeping the stone crusher at its Lilly White quarries in regular operation. The Whitehall, Nazareth and Hercules Cement companies are keeping up the output at their mills in accordance with the demand.

At a recent meeting of the board of directors of the Coplay Cement Mfg. Co., held at Coplay, the following officers were elected for the coming year: Herbert V. Steiner, New York, president, to succeed Ferdinand Loeb; S. Kuhn was made first vice-president, and A. Israel, second vice-president, succeeding David Frank; George A. Christ, Allentown, Pa., was re-elected secretary and treasurer.

Current mill prices in other important cement districts are: Hudson, N. Y., $1.90 a barrel; Fordwick, Va., $1.95; Hannibal, Mo., $1.85; Kingsport, Tenn., $1.95; Buffington, Ind., $1.70; Iola, Kan.; $1.95; Mason City, Ia., $1.95; and La Salle Ill., $1.70.

The International Portland Cement Co., New York, is planning for heavy production at its different mills during the spring and summer. One order alone, recently booked, calls for a delivery of from 75,000 to 100,000 barrels of material at Havana Cuba, for use in connection with local harbor improvements.

The Aetna Portland Cement Co., Union Trust Building, Detroit, Mich., has foundation work under way for the initial buildings at its new plant at Essexville near Bay City, Mich., and plans to proceed with construction work as fast as possible. The main building will be 375x900 feet, and will be supplemented with a number of other structures, with plant estimated to cost in excess of $750,000, with machinery. The new plant was outlined in these columns in PIT AND QUARRY a few months ago.

The Egyptian Portland Cement Co., Port Huron, Mich., is planning for the early occupancy of its new plant, comprising the former shops of the Grand Trunk Railway Co., here. The structures have been remodeled and improved ,and will be equipped in full for cement production.

The Globe Portland Cement Co., 416 McKnight Building, Minneapolis, Minn., is making ready for active construction in connection with its proposed new mills at Dubuque, Ia., building contracts for which were awarded

recently The plant will consist of a number of buildings, forming two complete operating units, and is estimated to cost about $1,600,000 complete. The C. L. Pillsbury Co. 1200 Second Avenue, South, Minneapolis is engineer for the project.

The Indiana Portland Cement Co., Greencastle, Ind., is maintaining active production at its local plant and heavy shipments of material are booked at an early date. One of the large contracts recently received by the company is for the Illinois State Highway Department, covering 160,000 barrels of cement for road construction during the season.

The Henry Cowell Lime & Cement Co., San Francisco, Cal., has acquired property at Tehachapi, Cal., comprising an extensive acreage of lime, cement rock and affiliated material deposits, and has preliminary plans under consideration for the erection of a new cement mill. It will consist of a number of buildings and is said to be estimated to cost in excess of $2,000,000, including machinery.

Maryland Activities

Sand, Gravel and Stone Men Get Started on Big Schedule

By Our Baltimore Correspondent

Sand and gravel plants in different parts of Maryland are resuming operations under a heavy production schedule with the opening of the spring season. Crushed stone plants, as well, are showing equal keenness to advance outputs, inspired by the heavy orders looming ahead for road construction.

At Baltimore, 1½-inch gravel is selling wholesale for $1.40 a cubic yard, while ¾-inch material is priced at $1.60. At the supply yards, $2.00 is asked for good, washed gravel, delivered on the job. Sand is being sold at $2.00 a cubic yard in the wholesale market, with active call for the commodity. Crushed stone in carload lots, f. o. b., city, is priced at $1.75 a ton for 1½-inch stock, and $1.65 for ¾-inch.

Portland cement is being quoted at $2.50 a barrel, delivered on the job, less bags, or about $1.00 a barrel below the figure at this same time a year ago. Common lime is being sold at $13.00 a ton at the warehouse, while hydrate finishing is bringing $15; common lump lime is priced at $12 a ton at the warehouse, with a rebate of 10 cents per barrel.

The Arundel Sand & Gravel Co., has filed plans for the erection of a new one-story fireproof shed, 22x80 feet, at its Pratt Street pier, Baltimore.

The plant of the Chesapeake Shell & Lime Co., Crisfield, Md., was partially destroyed by fire, March 22, with loss estimated at about $15,000. It is planned to rebuild at an early date. William H. Pierce is manager.

The Peach Bottom Corporation, Cardiff (Harford County), Md., has been formed with a capital of $1,500,000, to operate slate and rock quarries in this section. Work will be commenced at an early date. The company is headed by George J. Muller, Fred R. Williams and C. E. Proctor, all of Cardiff.

Property at Port Deposit, Md., formerly operated by the McClenahan Granite Co., comprising over 90 acres of land, will be sold at an early date by Robert C. Thackery and William J. Bratton, trustees for the Port Deposit Quarry Co., at an early date. It will include the stone crushing plant, and auxiliary buildings, such as power house, machine shop, blacksmith shop, etc., as well as screens, elevators and other equipment. The farm lands of the company, adjoining, will also be sold.

Pittsburgh District Has Satisfactory Trade

Production and demand are reaching a satisfying point in the Pittsburgt, Pa., district, and the opening of the spring season finds the different producers in good position to increase operations to the necessary status. The active companies include the J. K. Davidson & Brother Sand Co., the Iron City Sand Co., the Keystone Sand & Supply Co., and the Rodgers Sand Co. Good grade building sand at Pittsburgh shows a decline to a level of about $2.00 a ton, with material at the dock at around $1.50 a ton. Washed gravel is selling wholesale at $2.00 a ton at the waterfront, with deliveries on the job ranging to $3.00; sales are being turned f. o. b. barge at $1.60. Crushed stone, 1-inch stock, is priced at $5.50, delivered on the job. Local contractors are paying around $2.00 a barrel for Portland cement in carload lots, without bags, while supply dealers are asking $2.80 a barrel on the job.

News About Memphis

Brisk Demand for Materials for Big Building Program

By Our Memphis Correspondent

The high stage of the Mississippi river during April occasioned some little interruption to sand and gravel people. The waters were higher than for many years and there was a levee break near Helena.

There is a brisk demand for materials this spring, despite a very rainy season that has retarded contract work to some extent. Much road and street work, and construction work in general is causing good demand. At Memphis building permits for the first quarter of 1922 exceeded those of 1920 and doubled those of 1921. Stucco construction and residential work, warehouses, many of them with concrete floors or reinforcements, have given impetus to materials entering into that class of construction. Later in the season, probably by early summer there will be many large semi-public structures to start in Memphis, sky-scrapers, hotels, club buildings, churches and schools. These have been under plan for some time and the contracts will be let shortly. Road work in West Tennessee counties and in Arkansas is very active, a number of counties having previously floated bond issues for 1922 road building.

Improvements and additions to the plant of the Wolf River Sand Co. at Paine and Joe's Avenue, north of Chelsea Avenue, North Memphis, have been made at a cost of several thousand dollars. The capacity of the plant has been brought up to about 250,000 cubic yards annually. Recently the company acquired 150 acres additional land adjoining the company's site from which sand and gravel will be secured. A 12 inch Pulsomotor pump has been installed for the purpose of lifting sand, gravel and water from storage pit or lake into the washing and grading tower. Steam and atmospheric pressure are utilized on the vacuum system. The material is secured about fifteen feet below the surface of the ground. From the washing plant it is delivered into cars on tracks on one side or into trucks or wagons on the other. The company has added to its fleet of trucks, and is now using 20 five-ton trucks and 20 wagons. V. A. Vordes is president; W. W. Fischer and W. P. Brown, vice-presidents; Paul Damann, secretary-treasurer and J. H. Griffith, superintendent.

The concrete walks on the north and south sides of Court Square, in Memphis, are being taken up and the street widened accordingly with concrete surface. This is in the central or sky-scraper district and is a most desirable improvement. Some 25 feet of parking and traffic space will be added, and the park will still have ample walks, inside the curb. To the south of this park a 22-story sky-scraper is contemplated by Brinkley Snowden. The exterior will be of white tile, on steel frame work. The Court Square improvements were planned by Harry N. Howe, Commissioner of Streets, Bridges and Sewers. The contract for the work was awarded in April to the National Concrete Company.

North Second Street will be paved with asphalt from Concord to the city limits. Both this work and the improvement of McLemore Avenue was awarded to the Crinkley Construction Company. The contract on North Second is $79,767.25 and on McLemore, $35,312.40. Wm. C. Ellis was awarded the contract for the miscellaneous castings and two contracts for sewer pipe were given to A. J. Cook & Co. of Memphis, the prices being $41,973 and $24,670.06. The Greenville Stone and Gravel Co. was given the crushed stone contract at $2.13 a ton, and the contract for cementing gravel was awarded to the Memphis Stone and Gravel Co. at 50 cents a ton.

The F. D. Harvey Construction Co. of Memphis with a bid of $198,000 made the lowest bid for the Ashland, Miss. highway. Four bids were submitted from Mississippi, four from Memphis and one from South Carolina. Robt. A. Harris is engineer.

The new viaduct, representing one of the biggest pieces of concrete engineering work done for the Yazoo and Mississippi Valley R. R., at McLemore Avenue is nearing completion and will be opened June 10, with a formal celebration. The street car company is now making good progress laying its tracks across the viaduct, authority having been received from the headquarters of the Unit Construction Co., St. Louis. The viaduct will have a "great white way" lighting system.

The contract for the paving work on the Linden-Sommerville-Lamar main thoroughfare at Memphis was recently

awarded to the Bryant Paving Co. of Waterloo, Iowa. Their figures for the project were $148,023.17.

U. S. Engineer Thornton has accepted the new Dayton concrete road built by Hamilton County and pronounces it one of the best pieces of work in East Tennessee. The road is eight miles long and runs from Soddy to Sale Creek, connecting with oil roads on both ends, which gives Chattanooga a complete highway to within two miles of the Rhea county line.

It is stated that a saving of about $250,000 will be realized by the State of Tennessee in 1922 as a result of the Federal Court decision in April, at Nashville, in refusing an increase in freight rates on sand and gravel in Tennessee. Prior to the suit to prevent the 25 cents increase contracts had been let for a number of road projects and the contractors had been given a guarantee of projection against any loss in the event the rates were raised. This raise, it is stated, would have resulted in an increased cost to the state of approximately $1,000,000.

Contract for unloading 600 cars of gravel at Earle, Ark. and the hauling of 20,000 yards of it has been awarded by the Road Commissioners of District 6, in April to the Mississippi-Arkansas Truck Co. of Searcy, Ark., of which U. V. Thornton is manager. This is the first step in the expenditure of the last $350,000 road bonds to build more than thirty miles of gravel roads in this district for an aggregate of 62 miles. The first gravel from Jonesboro, Ark. pits arrived April 10. The thirty mile program will require about 1,200 cars of gravel, 60,000 tons, the remaining 600 cars to be purchased immediately after the first contingent is used up. When the present bond issue is expended, the Crittenden district will have spent $1,070,000 on hard roads in two years, building 62 miles, and the county $4,000,000 for 15 miles of concrete and 162 miles of gravel.

The tug Virginia was recently sold at Memphis by the Missouri Portland Cement Co. to the Arkansas City Gravel Company, for a consideration said to have been $9,000. She will take the place of the Alice, burned at Arkansas City some time ago.

Contracts for the construction of a hard surfaced road from Hartselle, Ala. to Cullman, Ala., on the Bee-Line highway has been let by the Alabama State Highway Commission to the Texas Roads Company, of Dallas, Texas. The road will be of crushed limestone with a surface of bituminous concrete.

It is reported that options have been taken north of Blue Mountain, Miss. and extending into Benton by a Sheffield, Ala. concern until May, with a view to developing Tippah County limestone interests.

A charter was recently granted at Memphis to the Pollard Sand and Gravel Co. capitalized at $100,000 to develop a pit in that city at the end of Breedlove Ave. A spur line will be put in from the Union Belt. The incorporators were J. A. Pollard, T. P. McDaniel, E. O. Miller and E. R. Thomas. Some machinery of Mr. Pollard's own invention will be installed.

The Allen Gravel Co. at 414-15 Exchange Bldg., Memphis, Tenn., is developing the Tishomingo gravel fields in Mississippi and reports good spring trade in road work especially.

The trial of the slayer of W. W. Rauscher, prominent lime manufacturer at Erin, Tenn. was scheduled in Houston county, Tenn. for April. Mr. Rauscher was slain Oct. 29, 1921 on the public streets of that town by a young man named Barfield Adams, the trouble said to have started with a church quarrel. Eminent legal counsel was retained both by the defense and prosecution.

It is announced that the Missouri and North Arkansas Railroad Co. running through a very important section of Arkansas from Helena to Joplin, Mo., will be put in operation again about May 1st, after being out of commission for many months. A new company was capitalized to operate the road.

The rehabilitation of the Tennessee Central R. R. between Nashville and Harriman by its new owners is going forward on a big scale. Much new rolling stock and track improvements will be made. H. W. Stanley is president. The road is an important outlet East and also runs west of Nashville to Hopkinsville, Ky. It has recently been taken out of the hands of receivers. This is the road built by Jere Baxter.

In the new $135,000 home of the Southern League Champions, Russwood Park, at Memphis, is found an ideally arranged baseball park and one of the most modern engineering projects of 1922. The park was completed for use in March. It seats about ten thousand.

Indiana's on the Job

Mr. R. C. Yeoman Urges in Letter Use of Proper Road Gravel

Mr. R. C. Yeoman, the active secretary-engineer of the Indiana Sand and Gravel Producers' Association, has the right idea on promoting the use of the proper materials for gravel roads. Mr. Yeoman recently examined a number of gravel roads that have been "weighed and found wanting." He discovered that it was only in the places where heavy pebbles were lacking that the roads were bad. He was then able to present a clean cut argument in the following letter sent to all the highway superintendents and county surveyors of Indiana:

"Reports are coming to me from all over the State that gravel roads are in worse condition this spring than they have been for eight or nine years. It also is true that many roads have gone through the spring thaw and yet carry their loads without breaking.

"This is the time to study the reason why roads have failed and the best means to prevent such recurrence. While many of the roads have gone down because of poor construction and drainage, my attention has been called by commercial haulers to failures due to improper materials being used, both in construction and maintenance. Some roads which have been regular boulevards for a good part of the year are now a series of mud holes, impassable not only to the commercial hauler, but to the touring car as well.

"I would feel that I was derelict in my duty if I did not call your attention to one method of prevention of a large part of the gravel road failures. Careful examination of a number of breaks has shown that the roads were built of sand, or of gravel containing too much fine material, including sand, clay and loam. In other words, the percentage of pebbles was too small.

"To the engineers I would recommend that future specifications for construction should call for screened materials with the objectionable amounts of sand and mud removed. To the highway superintendents I would suggest that the roads already built may be restored by a generous application of coarse material, so that during April and May, while the roads are yet soft, the coarser particles may become a part of the road surface.

"The commercial screening plants are beginning to operate now. Put in your orders at once and secure early deliveries. Call for coarse, clean material and apply it in copious amounts to the broken places on your roads. In the latter part of the season the graded materials may be used for top surfacing.

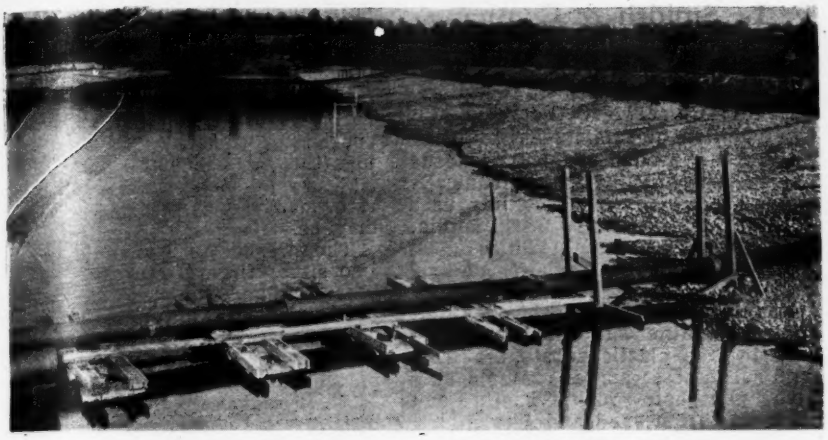
"Freight rates are probably as low now as they will be for a year. The recent Supreme Court decision places the matter practically in the hands of the Interstate Commerce Commission and, according to precedent, the matter of adjustment will be very slow. Whatever adjustment is gained this year will not be enough to wait for. The cost of the mud hole is vastly more than the freight rate plus several times the cost of the material. The hauling of unscreened gravel, with a large amount of sand and clay, into these mud holes will give only temporary relief and will need to be repeated next year. Including the cost of hauling and the application of the material, the expense of repair will be many times more than a timely application now of the properly graded material.

"Write our plants at once for quotations. If you are not familiar with the plants that furnish your territory, write this office, giving your delivery points, and we will be glad to put you in touch promptly with the producers who can supply your needs."

The Indiana Portland Cement company of Greencastle, Ind., has been awarded a contract by the Illinois state highway commission to furnish 160,000 barrels of cement for use in about ten counties in Illinois during the coming year.

The International Cement corporation has closed a contract covering construction work in Havana harbor which will probably involve between 75,000 and 100,000 barrels of cement for delivery this year.

The Benton Stone Co., recently incorporated with a capital of $20,000 at Oak Harbor, Ohio, has bought the Lipstraw & Reese stone crushing plant at Limestone, Ohio. They are installing additional machinery which will considerably increase the output of the plant.



Long Life of Welded Dredge Pipe

The American Rolling Mill Company has perfected a dredge pipe which possesses many specific improvements. The pipe differs materially from the ordinary dredge pipe construction, and the new features contribute to its exceptional lasting qualities.

The dredge pipe is designed for permanency, being made of special analysis steel. The seams in each section are welded together, using Armco welding rods. The welded seam is very advantageous. When pipes with riveted seams are used, stones and gravel passing through the pipes soon wear off the rivet heads. Welded seams correct this fault.

The various sections are joined together with lipped joints, being held in place by hooks which are welded near the end of each section. The lipped joints are flexible, thereby allowing the user of the pipe to lay a dredge line in the form of a circular arc if he so desires—it being possible to circle the pipe around the base of a hill or other obstruction.

The accompanying photograph illustrates an actual service installation. The pipe is installed at a minimum cost and it is easy to economically move it from place to place. Without disconnecting the sections, the pipe can be turned around and around. Such a feature is valuable as it permits the entire inside surface to equally resist the abrasive action of the moving stone and gravel.

The dredge pipe described has given exceptional service. It has been installed in districts where the soil was so abrasive in character that ordinary riveted steel pipe failed before 60,000 cubic yards had been removed. The special welded pipe replacements were found to be 500 per cent more serviceable, as they are still in use after having been used for transporting 350,000 cubic yards of material.

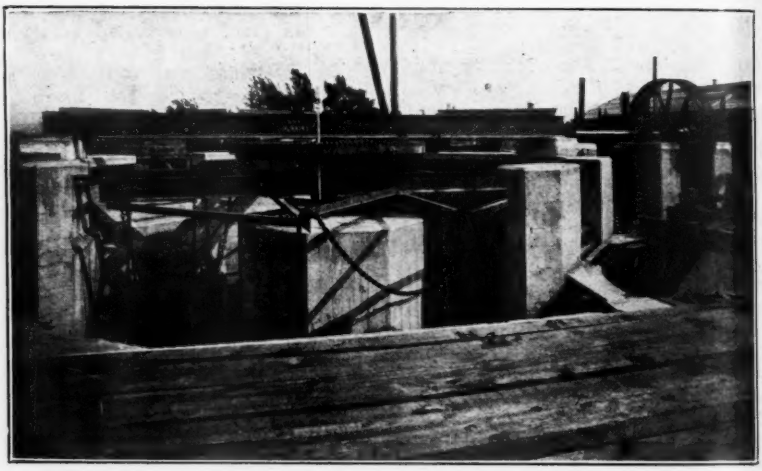
In one engineering project alone the long service life of this special analysis steel dredge pipe resulted in an 80 per cent saving. The engineers' original estimate called for 150,000 feet of dredge pipe. Thirty thousand feet of Armco special analysis pipe were so long lasting that the remaining 120,000 feet were never ordered.

Rennolds Equipment Company Organized

Mr. A. Rennolds, formerly district sales manager for the Equipment Corporation of America, has severed his connection with that company and has organized the Rennolds Equipment Company, which will maintain offices at 907 Lumber Exchange Building, Chicago. Mr. Rennolds expects, from this new location, to conduct an extensive business with pit and quarry operators and contractors. He is in the market to buy, sell, rent and rebuild used equipment. Mr. Rennolds will be very pleased to hear from readers of PIT AND QUARRY who are in the market for equipment, or who have machinery of any description for sale. The new company contemplates extensive operations and expects to be able to meet requirements of all kinds.

F. L. Smidth & Company's Washmill

The washmill, designed by F. L. Smith & Co. of New York, for the manipulation of soft earthy materials with water, produces a homogeneous pulp or semi-liquid mass technically known as slurry. It is mainly used in the Portland cement, bricg, kaolin, phosphate and iron industries. In some cases the washmill is merely used for the production of a homogeneous pulp from materials in their natural condition. In other cases it is used to free plastic substances from solid substances; as, for example, clay from phosphate rock; kaolin and brick clay from sand and foreign impurities from iron ore. More or less



solid lumps of materials are subjected to a certain amount of attrition, thereby effecting disintegration and an easier formation of pulp or slurry.

In Portland cement plants operating by the wet process, the washmill is used to prepare the materials either for the preliminary grinders or the finishing grinders as may be required.

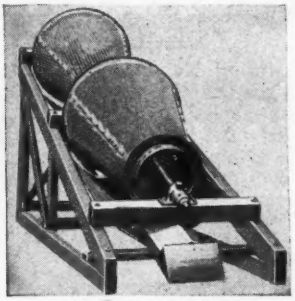
It consists of a circular or polygonal concrete basin which is usually lined with paving blocks. It is provided with a heavy center pier supporting a vertical shaft upon which revolves a spider actuated by bevel gear and pinion. The spider carries heavy harrows or drags which travel close to the bottom of the basin, and which by their motion drag the material over the bottom of the washmill thus agitating and disintegrating the material until it forms a pulp or slurry with the water. The material is fed through a large chute on one side of the basin; the discharge ordinarily arranged on the opposite side, consists of a grate with suitable openings through which the finished material may pass into a pump pit, a separator or a storage basin as the case may be.

The washmill is manufactured in two sizes; the larger size is 26 ft. in diameter and, on plastic materials, has a capacity of up to 35 tons an hour dry weight. It requires from 25 to 40 h. p., depending upon the nature of the material. The smaller size is 20 ft. in diameter and, on plastic materials, has a capacity of up to 20 tons per hour dry weight, and requires 15 to 25 h. p., depending upon the nature of the material.

The manufacturers claim that the cost of upkeep of the washmill is extremely small in proportion to the tonnage handled. The principal wear is upon easily replaceable harrow teeth. It is a slow speed device making from 8 to 10 revolutions per minute.

The washmill is recommended to Portland cement manufacturers operating by the wet process and using soft limestone and clay marl and clay, chalk and clay, or soft shale and plastic clay in connection with hard rock, as a most economical and convenient device for the purpose stated.

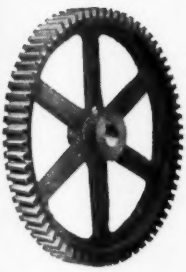
Literature and further information may be had from F. L. Smidth & Co., 50 Church St., New York City.

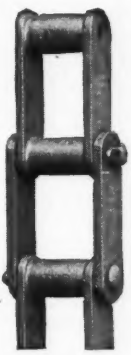


LINK-BELT
ACCESSORIES

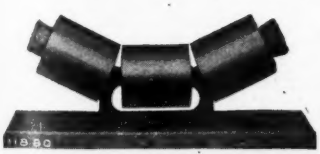
Bring your plant up to its most efficient working order. Your profits depend on running continuously every day. It will pay you to inspect your equipment carefully NOW—replace any bucket, chain, sprocket, or part that does not look as though it will stand the strain of a big season.

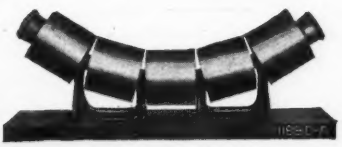
Let us help you put your plant in first-class condition, so you can begin the season right. The services of our nearest representative, and our experienced engineering department, are yours for the asking.





LINK-BELT COMPANY
CHICAGO—300 W. Pershing Road
PHILADELPHIA—Hunting Park Ave. & P. & R. Railway.





LINK-BELT

Catalog on Powdered Fuel Equipment

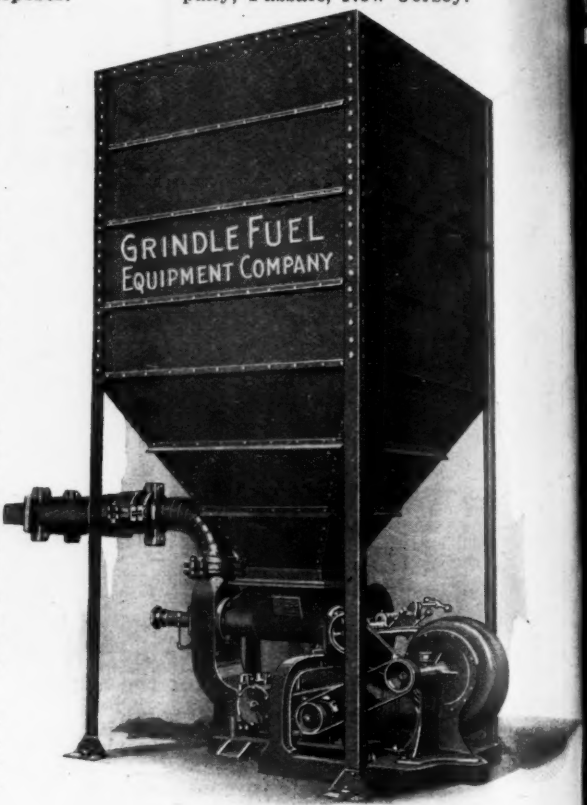
Catalog No. 4 of the Grindle Fuel Equipment Company contains a very comprehensive account of the powdered fuel systems manufactured by that company.

The Grindle Company, a subsidiary of the Whiting Corporation, installs pulverized coal systems in plants of all sizes, and for all purposes.

About half of the book is taken up with thorough description and profuse illustration of complete systems; the latter half with the descriptions and illustrations of the component parts. Included among these parts are many pieces of equipment that may be used in crushing, elevating, feeding and drying units in installations other than coal pulverizing.

The book is very thorough, carefully compiled and properly arranged, and proves interesting reading for anyone who has even the slightest interest in powdered coal systems, or who has use for some of the various pieces of equipment used in these systems.

Copies of the book may be secured from the Grindle Fuel Equipment Company, of Harvey, Ill.



New Literature on Portable Conveyors

"Portable Conveyors" issued by the Portable Machinery Company of Passaic, New Jersey, is an artistic twenty-four page booklet which shows a wide variety of uses to which the scoop conveyors of that company may be put. The book begins with illustration and description of the low cleat and high flight types, explaining the different purposes the two kinds serve. Succeeding pages of the book are taken up with descriptions of the loading and unloading of cars and trucks, the transferring of material under various conditions, and the various other uses which such a piece of equipment can serve. A large number of halftone illustrations and pen sketches show graphically what is stated in the text. Copies of the booklet can be secured by writing the Portable Machinery Company, Passaic, New Jersey.

The Valley Rock & Gravel Co., Brownsville, Texas, has been incorporated with a capital of $10,000. The incorporators are, W. H. Mason, Jr., A. A. Ririe and H. L. Montandon.

D. B. Cudworth, secretary, treasurer and general manager of the Empire Sand and Materials Co., Wichita, Kans., announces that the company has increased its capital stock of $100,000 and will begin the immediate erection of a brick manufacturing plant to cost approximately $20,000.